

NEW TAXA AND NOTES ON THE SCROPHULARIACEAE OF PERU

Gabriel Edwin

Roosevelt University

The new taxa now presented complete the listing of novelties found while preparing the family for the Flora of Peru. The new species are in the genera Basistemon, Bartsia, Castilleja, and Calceolaria.

Basistemon Turcz., provisionally placed in the Scrophulariaceae, now with six known species, enters Peru only locally in the east at elevations up to 1,000 m. Castilleja has 9 of its 200 species in the Andes of Peru. Bartsia with 32 of its 60-70 species in Peru, is the second commonest genus of the family present. Calceolaria has 120 species represented, the predominant genus of the "Figworts" in these mountains and perhaps the most prevalent in species number of all the flowering plants in the northern Andes. This genus with about 550-600 species is badly in need of monographic attention. There are more taxa of "Slipper-flowers" in Peru than in the remaining 31 genera of the Scrophulariaceae combined.

The treatment of Calceolaria for the Flora is necessarily limited. Only the most urgent comparisons with extra-Peruvian taxa were made and also no proof of a supposed evolutionary arrangement was attempted. A reasonably searching study indicated that the classical approach of Bentham<sup>1</sup> and Kranzlin<sup>2</sup> had to be abandoned. In its place will be found a key that is, I hope, far simpler. Most of the major separations are those, it is felt, that offer the most suitable morphological bases for a future phylogenetic study.

Before the descriptions of new taxa, mention must be made of a new combination.

LINDERNIA THOUARSII (C. & S.) Edwin, comb. nov. Nortenia thouarsii C. & S., Linnaea 3: 18. 1828. Torenia parviflora Ham. in Wall., Cat. 3958. 1828. T. nortenia Steud., Nomen. ed 2. 2: 692. 1841. T. thouarsii (C. & S.) Kuntze, Rev. Gen. 2: 468. 1891, and Wettst. in Engler and Prantl, Pflanzenf. 4(3b): 79. 1895.

Lindernia All. differs from Torenia L. in corolla tube and lip structure and in calyx tube and lobation sufficiently to maintain the generic separation. The Peruvian material concerned has the narrow corolla tube with short entire lobes as well as the equal, wingless, partly free calyx lobes characteristic of Lindernia. Therefore, all of this material has been referred to

the last mentioned genus. That all new world specimens thus far seen, except those from gardens, pertain to Lindernia, strongly indicates that Torenia is wholly old world. However, species of Torenia are widely cultivated throughout much of North, Central, and South America, and it is not beyond the realm of possibility that one or more taxa may escape and naturalize.

BARTSIA ANOMALA Edwin, sp. nov.

Herba perennis; calycis lobi lanciolongi vel lanceo-triangulari acuti quam tubus breviores; corollae tubus quam lobi longior exsertus galea quam labium brevior; filamenta glabra vel parce glandulosa; capsula brevior quam calyx vel eum equitans ellipsoidiovoidea apicem apiculatibus.

Perennial herb, usually pubescent, occasionally merely puberulent on stems branches and foliage, erect, sometimes branching from the base. Leaves linear to lanceolate, crenate, slightly bullate, obtuse, narrowed to base, sessile; inflorescences spikes, usually lax and basally interrupted; pedicels 1.0-2.5 mm. long; bracts usually as the leaves, except margins distantly crenulate to almost entire, especially near the apices of the branches; flowers 13-22(-26) mm. long; corolla yellow or lower lip occasionally red to purple; calyx 8-11 mm. long, tubular, the acute, narrowly lance-oblong or lance-triangular lobes shorter than the tube; corolla tube longer than the lips, over one-half exserted, galea shorter than the lower lip whose lobes are oblong, rounded; filaments glabrous or with a few, minute, sessile, scattered glands, anthers puberulent; ovary densely beset with long, stiff, golden hair; capsule usually shorter than the calyx, occasionally about equal to the calyx, ellipsoid-ovoid, obtuse, apiculate, pubescent on the upper half, as the ovary.

Cuzco: Cerro de Colquepata, rocky slope on trail from Paucartambo to Vilcanota, alt 3400-3700 m., Pennell 13176 (BM, type; PH).

Ancash: Cordillera Blanca, 4000 m. alt. Kinsl P2298. --  
Cajamarca: S.W. of Paso de Gavilan, S. of Cajamarca, alt 11,000 ft., Gourlay 96; Prov. Anta, alt. 3200 m., Herrera 3629. --  
Huancavelica: Prov. Tayacaja, Hills N. of Pampas, alt 3200 m., Stork & Horton 10247.

This species differs from all other Bartsias by the combination of the following characteristics: galea shorter than the lip and lanceolate-oblong or lance-triangular, calyx lobes that are acute and clearly shorter than the calyx tube as well as relatively long, much exserted corollas.

The Taxon appears sporadically over much of Andean Peru.

## BARTSIA AUREA Edwin, sp. nov.

Caules juniores et rami lanati; folia oblongilineara dense pubescentia remote crenata; flores aurea; galea glabra vel sparsissime puberula quam labium brevior; antherae parce vel dense lanata.

Perennial (?) herb, up to 30 cm. tall, stems and branches lanate, oldest stems excepted, branching from the base, main branches, oblong-linear, up to 4 mm. long, the bracteate blades narrowly lance-ovate or linear, 5-7 mm. long, margins remotely crenate, apex obtuse, base occasionally a little narrowed; spikes apical, up to 4.5 cm. long, lax or subdense; bracts almost as long as the calyx, with a few, distant pairs of marginal teeth; pedicels lacking or up to 1.5 mm. long; calyx cylindric, 7-8 mm. long, densely pubescent, eglandular or almost so, tube usually a little longer than the narrowly lance-ovate, acute lobes; corolla yellow, 9-10 mm. long, tube a little longer than the lips, galea glabrous to puberulent, shorter than the lip (about one-half as long), lobes of the lip spreading, unequal, elliptically ovate, the median much longer and a little narrower than the lateral; filaments inserted near the base of the corolla tube, apically sparsely glandular with sessile glands, anthers sparsely to less often densely long-pubescent, basally acuminate; style puberulent on upper half, stigma-lobes united, punctiform, ovary densely beset with long, stiff, golden hair; fruit unknown.

Cuzco: Paucartambo, open, rocky slopes SSW. of Paucartambo, alt. 3200-3400 m., Pennell 14171 (GH: NY; PH). The only collection.

Stems slender and with a grey cast when dry. The combination of the galea much shorter than the lip and also glabrous or sparsely puberulent, yellow corolla and unequal lobing of the lower lip, as well as the small size of the corolla separates this taxon from all other Bartsias.

## BARTSIA CURTIFLORA Edwin, sp. nov.

Herba parva recta vel ascendente ad 35 cm. dense pubescentia. Folia linearia vel anguste lancisubovatae, subintegra vel crenata plana vel vix revoluta; bracteae lineares et paucidentatae vel lanceisubovatae et plus minusve crenulatae; calycis lobi lanceolati vel anguste oblongi vel triangulari breviores quam tubus vel eum aequans; corollae tubus quam labium longior plus quam medium inclusum usque ad vix in toto inclusum galea quam labium brevior; antherae glabrae vel dense longi pubescentiae.

Erect or ascending, dwarf to 35 cm. tall, usually perennial,

rarely annual herb, usually branching from the base, densely pubescent, the inflorescence often glandular-pubescent as stems, calyx and corolla. Leaves linear to narrowly lancesubovate, only rarely exceeding 1.2 cm. long, usually less than 1.0 cm. long and 1-3(-4) mm. wide, subentire to crenulate, plane or little revolute, obtuse, narrowed or not to the sessile, clasping base; inflorescences long or short, usually dense, occasionally lax, often interrupted below, spikes or spikelike; pedicels up to 2 mm. long; bracts linear and few-toothed to lanceovate and more or less closely crenulate; calyx tubular-funnelform, 7-8 mm. long, lobes lanceolate or narrowly lanceoblong or -triangular, a little shorter to about equaling the length of the tube, acute; corolla usually yellow, 9-12 mm. long, tube from more than one-half to almost entirely included, longer than the lip, galea a little shorter than the lip; filaments sparsely glandular on upper one-half with sessile glands, anthers glabrous to more or less densely long-pubescent, basally acuminate; stigma lobes united, style puberulent over its entire length, ovary densely, stiff, golden pubescent; capsule longer than the calyx, oblong to ellipsoid-ovoid, obtuse with a sharp apiculum, the style or deciduous.

Cuzco: Ollantaitambo, open rocky slope, alt. 3000-3100 m., Pennell 13643 (BM; CH; NY; PH).

Arequipa: Pichu Pichu, alt. 13,500 ft., Stafford 810. -- Cuzco: Prov. Anta, alt. 3200 m., Herrera 3625; 3626; 3627b; alt. 3450 m., Vargas 296. -- Lima: Rio Blanco, alt. 3000-3500 m., Killip and Smith 21633. -- Punco: Araranca, alt. 4100-4300 m., Pennell 13433.

This species differs from all other *Bartsias* by the combination of the following characters: Galea shorter than the lip, bracts linear to narrowly lance-subovate as are the leaves, corolla tube largely included in the calyx, the anthers sometimes glabrous and the narrow acute calyx teeth that are as long as or almost as long as the calyx tube.

*BARTSIA DURIPILIS* Edwin, sp. nov.

Suffrutosa hispida, ramosa, caules 4-angulata; folia amplexicaulis usque ad 4 cm. longis et 1.5 latis, flores 10-12 mm. longis, axillaris, pedicellati, bracteae quam flores longiores, pedicellis usque ad 5 mm. longis; calycis libi lateovati, tubus corollae inclusus, galea duplo longior quam labium ei pro parte inclusa.

Subshrub, erect and branched, wood and foliage hispid, the pubescence thickened at base, stem 4-angled and striate-sulcate. Leaves amplexicaul and cordate-subhastate, widest at the base, mostly shorter than the internodes, oblong, the largest about 4.0 cm. long and 1.5 cm. wide, frequently 3.0 cm. long

and 1.0 cm. wide, very coarsely crenate, obtuse; flowers axillary, pedicellate, in upper leaf-axils; bracts longer than the flowers, subovate; pedicels up to 5 mm. long, densely pubescent; calyx obliquely campanulate, 8-9 mm. long, tube much longer than the broadly ovate, obtuse, 1-veined lobes, pubescent; corolla up to 12 mm. long, dark rose colored with the lower lip greenish bordered, tube longer than the lips, included in the calyx, galea dorsally tomentulose, obtuse, at least 2 times longer than the lower lip, barely emarginate, lip at least partly included in the calyx, lobes ovate, subequal; filaments with sessile glands on upper part, anthers pubescent with long matted hair, acuminate at base; style puberulent, stigma lobes united, ovary densely beset with long, golden, stiff hair; fruit unknown.

Ayacucho: Prov. Huanta: Putis, Choimacota Valley, in evergreen shrub woods alt. 3200-3300 m. Weberbauer 7533, (f).

A clearly distinct taxon differing from all other *Bartsias*, by the following combination of characters: stiffly hispid pubescence, large leaves, included corolla tube and partly included lower lip, oblique calyx with short, broad, obtuse lobes, longish pedicels, flowers borne in axils of leaves, not forming a definite spike or raceme and of small size. The lack of a definite inflorescence is rare in *Bartsia*.

*BARTSIA GLABRA* Edwin, sp. nov.

Herba, caules simplex, parce apperssa vel subapperssa puberulentia vel pubescentia; folia glabra; capsula glabra vel parce albidopubescentia; flores 8-12 mm. longi, corolla alba, galea quam labium vix longior eglanduasa.

Herb, stems simple, sparsely puberulent, rarely pubescent with the short-pubescent subappressed or appressed, foliage and fruit glabrous or the capsules occasionally with scant, white pubescence apically. Leaves linear or aciculiform to narrowly oblong-linear, up to 11 mm. long and 1-2 mm. wide, often 6-8 mm. long, margin bullata-crenate and revolute, obtuse and hamate at apex, slightly broadened and clasping at the sessile base, the costa elevated beneath; spikes dense above, interrupted below; bracts shorter than the flowers, similar to the stem leaves, except margins crenate on upper part only and a little wider in relation to the length; pedicels 1-2 mm. long; flowers up to 12 mm. long, usually 8-10 mm.; calyx 4-6 mm. long, tube longer than the lobes, pubescent on the veins, lobes narrowly ovate, acute, pubescent on the veins, margins ciliates; corolla white (in life), tube exerted, longer than the lips; galea pubescent, a little longer than the lower lip; filaments apically sparsely glandular and sparsely, very short-puberulent just below the

summit, anthers glabrous to sparsely long-pubescent, acuminate; style puberulent above, stigma lobes united, ovary glabrous or apically with scant, stiff, white pubescence; capsule ellipsoid-ovoid, shorter than the calyx.

Amazons: cerro de Fraijaco (Huaui-Huni), n.e. of Tambo de Ventilla, dry jalos, alt. 3500 m. Pennell 15878 (PH).

This species differs from all other *Bartsias* by the following combination of characters: corolla whitish, foliage, fruit and ovary glabrous or almost so, eglandular galea and appressed puberulence on most of the stems.

*BARTSIA PEDICELLATA* Edwin, sp. nov.

Herba annua, caulis pubescentium-puberulum multicellularum, applanatum; folia glabra vel parce multicellulosa pubescentia venibus majoribus et marginibus; flores in laxis racemis aggregati vel axillari; pedicelli erecti stricti 7 (-8) mm. longi; calycis lobi crenati, ovarium glabrum; capsula glabra oblonga subduplo longior quam calyx.

Erect annual herb simple or with a few, short, rosulate branches, stems pubescent-puberulent with flattened, somewhat curly, multicellular hair. Leaves glabrous or sparsely pubescent on the margins and main veins with multicellular hair, linear or narrowly oblanceolate, up to about 1.0 cm. long and 0.2 cm. wide, crenate-revolute, apex obtuse, hammate, base sessile subclasping; floriferous over most of the length of the stems in lax racemes, or flowers axillary; bracts wider than the cauline leaves; pedicels 7 (-8) mm. long, erect, almost parallel to the stem; flowers 8-11 mm. long; calyx oblique, tube longer than the crenate, obtusely rounded lobes; corolla purple, tube longer than the lips, galea tomentose with multicellular hair, about twice as long as the lip, lobes of the lip elliptic-oblong; filaments sparsely glandular above with sessile glands, anthers tomentose, acuminate at base; style glabrous, stigmas united, ovary glabrous; capsule glabrous, oblong, almost twice the length of the calyx, mucronulate at the obtuse apex.

Cuzco: Paucartambo to Trés Cruces, Cerro de Cusilluyoc, moist gravelly banks and swales, alt. 3500-3800 m., corolla "dull magenta purple". Annual herb, Pennell 13815 (F, type; BM; K; PH).

This taxon differs from all other *Bartsia* by the combination of multicellular, flattened pubescence on the stems and branches, erect, strict, 7-8 mm. long pedicels, crenate calyx lobes and glabrous capsule twice the length of the calyx.

## BARTSIA SIMULANS Edwin sp. nov.

Frutex parvus ad basim ramosus, pubescens mixto pillis et glandulosis et eglandulosis aliquando duris; folia et bracteae lobis margine amplificati ad apice, calycis lobi longiores quam tubus oblongi vel laceoblongi; corolla inclusa vel fere exserta; antherae glabrae and basim mucronulatas.

Perennial shrublet up to about 20 cm tall, branching from the base. Stems terete, drying light to dark brown, the soft, glandular-pubescence mixed with soft and loose scattered, stiff, eglandular hairs; leaf-blades thickened, sessile, pubescent above, beneath and on the margins as the stem, except more stiff hairs present, obovate or spatulate-obovate or oblong-obovate in outline, up to about 1.0 cm. long and half as wide, margins with 3-5 pairs of rounded, close or distant lobes, these increasing in size base to apex, the apical lobe largest, narrowed to base, venation obscure above, apparent beneath; flowers in short, apical, dense, spikes; bracts similar to the leaves, except a little smaller and the 2-3 pairs of lobes usually more or less distant, shorter than the flowers; calyx glandular, 9-11 mm. long, tube 4-5 mm. long, little shorter than the 5-6 mm. long, lance-oblong or oblong, subacute lobes; corolla 10-13 mm. long, yellow and red, almost wholly included in the calyx to little exserted, the corolla tube entirely included, narrow, longer than the lips, galea 3.0-4.5 mm. long, dorsally densely glandular, apically notched, little shorter than the lip, lobes of the lip very broadly ovate to suborbicular, the median little larger than the lateral; stamens didynamous, the pairs very unequal in length, anthers glabrous, basally mucronulate, filaments sparsely puberulent (under 20x); style exceeding the stamens, stigma exserted, punctiform, ovary densely, golden pubescent, the hairs stiffish; capsule elliptical or elliptically obovoid, little shorter than the calyx, pubescent at least apically with long, stiffish, golden hairs and apiculate, style tardily deciduous or persistent, placenta thin; seed numerous, ovoid, narrowed to both ends, testa striate-striatulate, closely adherent.

Puno: San Antonio de Esquilache in clefts in face of rock at alt. 15,500 feet, 5/16/37. Stafford 743, (BM).

Most closely resembling Bartsia diffusa Benth. which has ovate bracts whose lobes decrease in size base to apex, exserted corollas, wider calyx lobes that are usually not longer than the calyx tube and different pubescence.

## BARTSIA VIRIDIS Edwin, sp. nov.

Herba caulibus juvenalis pubescentiis pilis linearis

disposita, veteris saepi glabratis; corolla viridas tubo et labio incluso in calycem galea duplo longior quam labium eglandulosa pubescetia capsula ovoidea obtusa quam calyx breviora.

Annual, erect herb, old stems glabrate, younger with definite lines of soft pubescence, all stems 4-angled, sulcate, drying very dark red to black. Leaves linear or aciculiform, usually minute to 6 mm. long, occasionally reaching 2.0 cm., bullata-crenate and revolute, apex obtuse, hamate, often a little widened to the clasping base, sessile, glabrous or sparsely pubescent, main vein elevated beneath, other venation not visible; flowers mostly aggregated into short, lax, interrupted spikes; bracts crenate, at least the upper ellipsoid-ovate, about as long as or barely exceeding the calyces; flowers sessile or subsessile on pedicels reaching 2 mm. long, usually not exceeding 1.5 mm., and very small for the genus, 8-10 mm. long, occasionally up to 11 mm.; calyx narrow, usually glandular-puberulent, 4.0-5.5 mm. long, tube longer than the lance-triangular, acute lobes; corolla green, tube longer than the lips, galea up to 2 times as long as the lower lip, usually about 1.5 times longer, eglandular, pubescent, lobes of the lip unequal, the median longer than the lateral, all ovate, rounded; filaments sparsely dotted with small, sessile glands, anthers pubescent, mucronate at base; style puberulent above, stigma lobes united, ovary beset with long, stiff, golden hair; capsule ovoid to broadly ovoid, obtuse to rounded at apex, with long, stiff, golden hair apically, a little shorter than the calyx and enveloped by it.

Cuzco: Paso de Tres Cruces, Cerro de Cusilluyac, mossy banks and knolls on paramo, alt. 3700-3900 m. Pennell 13826 (F, type; BM; CH; K; NY; PH).

The combination of very small, green flowers with included corolla tube and partly included lower tip as well as the arrangement of the pubescence on the stems and branches separates this taxon from all other Bartsias.

According to the collector the corolla is "mignonette green".

BASISTEMON INTERMEDIUS Edwin, sp. nov.

Frutex inermis; caules minute puberule; folia sessilia vel subsessilia glabra ovate marginibus minute serrulatis basis obtusis; petioli puberuli ad basim gibbosos; flores axillares brevipedicellatae paucifasciculatae et pedicelli et calyces puberuli.



Unarmed shrub with glabrous leaves, otherwise mostly minutely puberulent. Leaves ovate, acuminate, 3.5-6.0 cm. long and 1.5-3.3 cm. wide, bases obtuse, margins minutely serrulate, punctulate on both surfaces; petioles up to 0.8 mm. long or lacking, minutely puberulent, gibbose at base and at least partly surrounding the stem; flowers 2-3 fasciculate, in axils of unmodified leaves, pedicellate; pedicels 3-5 mm. long, puberulent, with a pair of minute, hard, puberulent bracteoles at the bases calyx with 5 ovate, puberulent lobes, 3.0-3.5 mm. long, apices long-acuminate, margins ciliolate, united about 1/3 their length into a campanulate tube; corolla weakly saccate at base, whites, 7-8 mm. long, bilabiate, lips subequal, the 2-anterior lobes little shorter than the 3 posterior, tube about 6 mm. long; stamens 4, didynamous, anterior pair about 2 mm. long, posterior 3 mm. long, anthers sub-ovoid, divergent, dehiscing by longitudinal slits, connective enlarged, **hardened** at maturity, filaments gibbose at base, inserted about 1 mm. above the base of the corolla tube; ovary narrowly ellipsoid-ovoid, much shorter than the style, stigma lobes united, punctiform; fruit unknown.

Haunuco: Ganso Azul, Agua Caliente on Río Pachitea, alt. 1000 ft. dense shade; Oct 17, 1942, C. Sandeman 3380 (K, type; OXF).

Near B. peruvianus Benth. & Hook. f. apud Hook f. & Jacks. but differing in the length of corolla lobes in relation to the tube, distribution and amount of vesture and in size of the leaves. The taxon appears to stand between B. peruvianus and B. Moldenke.

CALCEOLARIA AEQUILATERALIS Edwin, sp. nov.

Herba perennis saepe volubilis caules molliter 4-angulata. Petioli alatis, alae latae connat, ad caulem latissima costa infra elevata planata; laminae superiores sessiles cetera (petiolata) latissima deltoidea vel ovatodeltoidea latiora quam longiora; dichasia paucifloribus flores usque ad 40 mm. longos; sepala ovata acuta vel acuminata usque 23 cm. longa; corolla magna labium inferum saccatum fere apertura clausa; thecae antherarum plerumque inaequalis; stylus 8-10 mm. longus.

Perennial herb, often scrambling, stem soft, 4-angled, frequently pubescent or puberulent, especially below. Leaves bizarre, petioles broadly winged, connate, broadest at the stem, usually serrulate, at least on the lower half, occasionally irregularly dentate, usually a little shorter than the blade, midvein flattened, elevated beneath, uppermost blades sessile, broadly ovate, usually the smallest, remaining blades (petiolate) very broadly deltoid or triangular, less often ovate-triangular, frequently wider than long or as wide as long, very big for

the genus, 8-12 (-14) cm. long and 9-14 (-15) cm. wide, irregularly coarsely crenate-dentate, narrowing to apex, cordate or truncate at base, occasionally broadly ovate, puberulent; inflorescences usually few flowered, ca. 7-15, dichasiate; flowers up to ca. 40 mm. long; sepals up to 23 mm. long, broadly ovate, acute or acuminate, glabrous or puberulent on lower half; upper corolla lip ca. 8-15 mm. long, cucullate, lower lip to 30-35 mm. long, orifice almost closed, nectiferous flap much lighter colored, sac much inflated in life, glabrous, except for a tuft of hair inside at base; anthers large, cells usually ca. 2 times as long as wide, mostly unequal, occasionally sub-equal or equal, filaments short; style 8-10 mm. long; ovary pubescent; capsule broadly ovoid, narrowed to apex, densely pubescent, much smaller than and overtopped by the closely investing calyx.

Amazonas: Cerro Puma-urco southeast of Chachapoyas. Rocky bank near summit, alt. 3300-3400 m., Pennell 15905, (PH, type; F: NY); Rocky cliff, alt. 3300-3400 m., Pennell 15894. --Cuzco: Macchu Picchu, Urubamba Valley, ca. 5000 ft. alt., Balls 6812; 2000 m., Rauh-Hirsch P854; 809. -- Lima: Hualgayoc: Monte Seco, alt 1800 m., Soukup 3834. -- Pasco: Huariaca, wet place alt. ca. 9500 ft., Macbride 3124.

CALCEOLARIA ANNUA Edwin, sp. nov.

Herba annua ad 20 cm. alta, ramosa, pars superus pilis 2-cellulis et glandulosis, glandulae parvae, ad basim glabratae; folia petiolata, parva, laminae ovatae, irregulariter grosse dentatae vel interdum pinnatae, pinnae variabilis, contextus superus frequenter glabrus rare pubescentius inferus frequenter pulverulentus usque ad 3 cm. longa plerumque 1-2 cm. longa et 6-9 mm. lata basis mox decurrens in petiolam; petioli dense pubescentes discreti; inflorescentia plerumque cymosa 3-floribus, rare reductio ad 1- flore in axillis laminarum summis; antherae stipa brevissima, loculi et superi et inferi fertiles.

Annual, branched herb, upper part of the stems pilose with 2-celled, usually gland-tipped hairs, glands minute, becoming glabrous near the base, internodes almost always longer than the leaves. Leaves petiolate, very variable, especially as to margins, usually ovate in outline, mostly 1-2 cm. long and 6-9 mm. wide, rarely reaching 3 cm. long, margins from grossly dentate especially below to occasionally pinnate or almost so above, when pinnate, the pinnae variable in size and outline, tissue usually glabrous above, occasionally pubescent, most often pulverulent beneath, base of the blade only over short decurrent on the densely pubescent, discrete petioles; inflorescences most often 3-flowered cymes, rarely reduced to 1 flower, borne in pairs from the axils of the uppermost leaves or occasionally from

the axils of the upper 2-3 pairs of leaves; peduncles up to 3.5 cm. long, pilose as the upper part of the stems; flower size variable; calyx tube pubescent, lobes externally subglabrous, veins parallel, internally glabrous, ovate or elliptical, acute, sometimes 2 different sizes on one flower, 6-8 mm. long and 2-5 mm. wide; corolla yellow, upper lip 2-4 mm. long, sparsely glandular, glands red, sessile, internally glabrous, nectary almost marginal on the inflated 12-15 mm. long sac, 2-parted, very reduced; filaments less than 1 mm. long, anther cell connective shorter than both of the fertile locules the larger of which is about 2 mm. long and the smaller about 1.3-1.4 mm. long; style glabrous, little curved, 1.9-2.4 mm. long; capsule about as long as to little longer than the calyx, glabrous, ovoid, the upper part abruptly narrowed into a short, lanceolate neck, style soon fugacious.

Lima: Moist rock ledges and granitic soil, S. of Surco, 2400-3500 m. alt. Pennell & Ferreya 15245, (US, type: PG).

Distributed in Dept. of Lima and possibly one collection from Junín (Iltis, Iltis, Ugent & Ugent 226, WIS).

Lima: Rio Blanco, between San Mateo and Casapalca, alt. 3500-3550 m., Ferreya 6974; Rio Blanco, alt. ca. 15,000 ft., Macbride 3038; alt. ca. 12,000 Macbride & Featherstone 683; Canta, alt. 2700-3200 m., Pennell 14333.

The combination of usually dentate leaves and relatively large corolla with copious sac and very reduced nectary distinguishes this taxon from C. delicatula Kränzl. to which it is morphologically closely allied.

#### CALCEOLARIA APERTA Edwin, sp. nov.

Folia angustiovate vel ovata vel oblongiovata brevipetiolata dense lanata usque ad dense tomentosa; labium superum corollae ca. calycen aequilongum inferum vix saccatum, apertum excepte ca. 1-3 mm. ad margines; stylus 7-8 mm. longus, stigma gibbosa latior quam stylus.

Shrub to about 1 m. tall, foliage densely lanate or tomentose, stem branched, drying red-brown, appressed-puberulent or -pilose when young, glabrate in age. Leaves narrowly ovate or ovate or oblong-ovate, those of the stem up to 4.2 cm. long and 2.0 cm. wide, usually a little smaller, those of the branches smaller, all leaves densely lanate when young, becoming tomentose with age, margins crenate-dentate or crenulate-denticulate, apices acute, bases broadly obtuse to (especially the larger) cordate, short-petiolate; petioles lanate; flowers in compound dichasia with long, basal peduncles (up to 5.5 cm.) and short

pedicels, ca. 0.5-2.0 cm. long, flower stalks puberulent to tomentose; calyx lobes ovate, ca. 6 mm. long and almost as wide at base, apex obtuse, tomentulose on both surfaces; corolla 13-17 mm. long, essentially glabrous, upper lip erect, up to 5 mm. long, almost as long as the sepals, hooded, lower lip saccate merely along the margin, about 1-3 mm., nectary thin, linear; filaments short, ca. 1 mm. long, thickest at base; anthers large for the corolla, each cell about 2 mm. long and almost as wide medianly, broadly ovoid, papillose-glandular, drying brown with buff colored lower margins; style thickened, 7-8 mm. long, stigma very thickened and gibbose much larger than the style, ovary short, broadly ovoid, densely beset with sessile glands; capsule unknown.

Lima: Prov. Canta: near Antaicocha, Cerro Colorado, east of Canta, rocky wall of canyon, alt. 3600-3800 m., Pennell 14642, (US, type; PH).

A very clearly marked taxon with no morphologically similar species in Peru. Known only from the type collection.

CALCEOLARIA ARBORESCENS Edwin, sp. nov.

Frutex subglaber ramosissimus erectus caulibus rigidibus et follis bicoloris, dimidiis subcoriaceis. Inflorescentia multiflora paniculata-dichasia plus minusve puberulenta-pubescentia et glandulosa; labium superum corollae breviorum quam sepala, labium inferum plus quam duplo longior superum saccata usque ad one-half - three-fifths ea longitudo, minute papilloso-glandulosa; stamina brevissima, thecae antherarum inaequales longitudo plus quam duplo latitudo.

Erect, much-branched, subglabrous shrub up to almost 3 m. tall with rigid stems and subcoriaceous, bicolorous, viscid leaves, pubescence restricted to the inflorescences and sometimes the younger wood. Leaves ovate to less often elliptical, variable in size from 1-6 cm. long and 0.5-2.5 mm. wide, usually ca. 3-5 cm. and 1-2 cm., entire to serrulate, narrowed to apex and base, often dimidiate, drying dark green above and pale yellow-green beneath, veins faintly visible above, prominent beneath, costa a little elevated, other venation reticulate, petiolate; petioles up to 1.4 cm. long, mostly 5-8 mm. long; inflorescences many-flowered, paniculate-dichasia, terminal on the branches; the flower stalks puberulent or pubescent, basal peduncles up to 4.5 cm. long, terminated by a pair of reduced leaves, decreasing to ultimate pedicels a few mm. long; calyces puberulent-pubescent, lobes unequal in width, ovate to elliptical, 6-8 mm. long and 3-5 mm. wide at base, margins minutely ciliolate, apices acute, internally usually glabrous; corolla yellow, 25-27 (-30) mm. long, both lips externally more or less densely beset with minute, stalked glands; upper lip hooded, up to about 4 mm. long, lower lip up to 25 mm. long, saccate up

to three-fifths its length, only little narrowed proximally, glabrous internally or a tift of white hairs at base; filaments very short, anther cells divaricate, slightly to very unequal in size, each pair of cells 5 mm. long, each cell most often at least twice as long as wide, anthers dehiscent thru the septum; style 3-4 long, a little curved at apex, stigma punctiform, ovary glandular as the corolla; capsule not known.

Amazonas: Cerro Calla Calla above Leimebamba (19 km.), alt. 3000 m., Hutchison & Wright 6916. --Ancash: Bolognesi, between Tallenga and Pachapaque, Ferreya 7479; Ancash: West slope of Cordillera Negra, below Paso de Collán, rocky slopes and banks, alt. 3690 m., Pennell 15476, (PH, type; PH; US); Moist bank above stream, south slope of Paso de Fortalésa, alt. 3550 m., Pennell 15398. --Punin: alt. 3500 m., Ochoa 721.

Morphologically closest to C. deflexa var. aurantiaca and also C. deflexa var. typica differing from both in having the lower lip of the corolla more than twice as long as the upper, in unequal anther cells and in the upper lip of the corolla shorter than the sepals as well as different vesture in the inflorescence. C. arborescens differs from the typical deflexa also in leaf shape. The superficial resemblance between arborescens and deflexa var. aurantiaca is striking but the taxa differ profoundly on a technical basis.

CALCEOLARIA BRACHYANTHA Edwin, sp. nov.

Frutex glandulosus ramosissimus laminis minutis ad parvis; labium inferum corollae saccatum three-fourths - four-fifths eus longitudinus; sepalis utrinque glanduloso-pubescentis; staminibus perbrevis filamentis subobsoletis antheris divaricatis inaequalis parvis; capsulis longiore quam calyce dense glandulosis.

Glandular, erect shrub, much branched with ascending branches. Leaves minute to very small, sometimes with abbreviated shoots in the axils, the leaves then appearing clustered, linear or occasionally lanceolate-linear or aciculi-form, mostly 1-3 mm. wide but infrequently up to 6-7 mm. and up to about 1.2 cm. long, mostly shorter, margin entire or with 2-3 pair of teeth near the apex, usually revolute, apically acute, either sessile or short-petiolate, when present the minute petiole thickened and the leaf-base short-sagittate, blades glandular-puberulent or -pubescent on both surfaces, especially on the costa beneath, main vein impressed above, elevated beneath, other venation obsolete, tissue dark green above, pale green beneath, coriaceous and usually thickened; inflorescences terminal on the branches, few- to about 15-flowered, regularly or irregularly branching dichasia; peduncles and pedicels glandular and erect, peduncles usually 2-3 times longer than the pedicels; flowers very variable in size; sepals lance-ovate to ovate on the

same flower, usually about 4 mm. long and 3 mm. wide at base or 5 mm. long and 2 mm. wide at base, (those of the smallest flowered collections about two-thirds the others), acute, glandular-puberulent on both surfaces; corolla yellow, 13-26 mm. long, externally glabrous or the upper lip puberulent; upper lip about one-half - two-thirds the length of the sepals, covering the stamens, lower lip oblong, saccate about three-fourths - four-fifths its length, internally glabrous; stamens with very short (subobsolete) filaments, anthers among the smallest in the genus, cells a little unequal or almost equal, divaricate, each pair ca. 2.5-3.0 mm. long and about one-third - one-half as wide; style thickened, ca. 2.0-2.5 mm. long, about the size of the densely glandular ovary; capsule glandular, exceeding the calyx, 5-7 (-8) mm. long, and 2-3 mm. wide at base, ovoid-conic, long acute, style persistent.

Distributed in the Andes from north central Peru, departments Ancash, Libertad and Cajamarca.

Cajamarca: Rocky limestone, alt. 2750-2850 m., ridge 11 km. S. of Cajamarca, Pennell & Anderson 15076 (PH).

Ancash: Shincush above Chiquián in Prov. Bolognesi, alt. 3980 m., Ferreyra 5820 --Cajamarca: Between Cajabamba and Huamachuco, Prov. Cajabamba, alt. 3000-3200 m., Ferreyra 3053; Cumbre above Cajamarca, alt. 3500 m., Olsson 2; Cajamarca - Culentin (prob - Celedin) Road, km. 15.5, Olsson s.m., Feb. 11, 1948; Rocky limestone, alt. 2750-2850 m., ridge 11 km. S. of Cajamarca, Pennell & Anderson 15077; Banos del Ynca, just outside Cajamarca, Soukup 4627 and 4630. --Libertad; Toyabamba, in Timber-line scrub, alt. 11,000 ft., Carricker s.n.; Otuzco, Ferreyra 3043; Above Huamacucho, alt. 3400 m., Pennell & Ferreyra 14872.

This species is close to Calceolaria linearis R. & P., C. cajabambae Kr. ludens Kr. and C. engleriana Kr., differing from these by various character combinations especially anther size, calyx lobe shape and vesture and leaf blade shape and size.

CALCEOLARIA COLCAMPARENSIS Edwin, sp. nov.

Herba simplex vel pauciramosa adpressa pubescentia; rami abbreviati axillari; margines laminarum serrata-serrulata, vena subta elevata incrassata; petioli descreti, incrassati; sepala juvenalia ut lamina pubescentia, veteres sparse pubescentia et venulosa; corolla 13-17 mm. longa, glabra, fere medio saccata, orificium obliquum.

Erect, appressed-pubescent herb, stems simple or few-branched, branches, when present, frequently abbreviated in leaf-axils, nodes mostly much longer than the leaves, pubescence

soft, white or light-gray, densest on younger growth. Leaves short-petiolate, ovate or less often narrowly ovate, all but the largest at least twice as long as wide, (1.5-) 2.0-4.8 cm. long and 0.6-2.0 (3.0) cm. wide, margins serrate-serrulate, apex broadly acute, base cuneate, densely appressed-short-pubescent and red-punctate above, appressed-pubescent on the elevated, almost white, thickened veins and densely red-punctate beneath; petioles 2-10 mm. long, sparsely to densely pubescent, thickened, discrete; inflorescences terminal or in upper axils, dichasiate-corymbose, few- (ca. 3-5-) to many-flowered (ca. 15-20); basal peduncles up to 3 cm. long, flower-stalks decreasing to ultimate pedicels a few mm. long, all stalks densely appressed-pubescent; calyx lobes when young with pubescence and venation as the lower surface of the leaves, veins with age less apparent and vestiture less dense, mostly ovate, acute, 7-10 mm. long, internally glabrous; corolla yellow, wholly glabrous, 13-17 mm. long; upper lip 2-4 mm. long; lower lip distally almost round, saccate less than one-half way, orifice oblique; stamens small, filaments short, anther cells equal, divaricate, a little less to a little more than twice as long as wide, each cell ca. 1.2-1.4 mm. long, red-brown when dry; style 1.5-2.0 mm. long, glabrous, ovary resinous, dark red-gland-dotted; capsule broadly ovoid, abruptly long-acute, 5-6 mm. long and wide, red-gland-dotted.

Amazonas: Roadsides on dry loam, alt. 2300-2800 m., Colcamar, Pennell 15604, (US, type; PH; US).

This species differs from all other *Calceolarias* by the combination of the following characters: flattened, elevated, white venation on the leaf blades beneath, densely red-gland-dotted fruit, calyx and blade, sepals often about half as long as the lower lip of the corolla and adpressed pubescence on the stems and branches.

*CALCEOLARIA COLLANESIS* Edwin, sp. nov.

Frutex ramosissimus, lignis juvenalis dense albis puberulentis-pubescentiis, venustis glabrescentiis, internodiis distantiis, ramis et ramulis tortuosis in sicco brunneus and atrobrunneus vel nigrus; petiolus basim induratus, lignosus, imcrassatus; calycis lobi extus glabri vel puberulenti elliptici vel ovati; corolla usque ad 12 mm. long, vix saccata.

Erect, much-branched shrub, the wood when young densely white-puberulent-pubescent, becoming glabrous with age, branches twisted, drying brown to dark brown or black, internodes much longer than the leaves, sometimes 5-7 times as long. Leaves petiolate, ovate to very broadly ovate, 0.6-1.5 cm. long and 4-10 mm. wide, margins narrowly revolute, thickened, with 3-7 pairs of

obtuse lobes or teeth, pubescent-puberulent on both surfaces, hairs curly beneath, apically acutish, basally broadly obtuse to subtruncate; petioles short, up to 5 mm. long, pubescent-puberulent, thickened, swollen and woody at base, the petioles of the main stems and branches with abbreviated branchlets in the axils; inflorescences simple or branched dichasia, borne in upper leaf-axils on stems and branches, occasionally the dichasium suppressed and axils 1-flowered; flower stalks short, pubescent-puberulent; bractlets when present, minute; calyx lobes elliptically ovate or elliptical, 5-6 mm. long and 1.5-2.5 mm. wide, pubescent on both surfaces; corolla 11-12 mm. long, drying dark brown (orange-red in life?), lower lip ca. 2 mm. long, upper lip saccate distally only 1-2 mm., sac undulate, nectary only partly reflexed-hidden, almost as long as the sac, entire lip glabrous or sparsely papillose-puberulent; filaments 1.0-1.5 mm. long, anther cells equal, divaricate, little longer than wide; style ca. 1.0-1.5 mm. long, ovary red-shining-glandular; capsule exceeding the calyx, 7-8 mm. longer, narrowly ovate to ovate, upper half narrowly elongate, beaklike, red-shinning-glandular, glands short-stalked.

Known only from the holotype.

Ancash: Western slope of Cordillera Negra, below Paso de Collan, bank along stream, alt. 3500 m., Pennell 15470, (PH).

Although the specimen is not well prepared it is sufficient for description.

This taxon is quite distinct from all other taxa due to the combination of open corolla with undulate sac and prominent nectary as well as the swollen petioles with abbreviated axillary shoots and finally the long internodes.

CALCEOLARIA CORDIFORMIS Edwin, sp. nov.

Herba perennis scandentia vel fruticula; caules ramosi juvenali dense tomentoso lanati veteres fere flabri; lamina sessilia vel subsessilia lateovata-cordiforma plerumque usque ad 1.5 cm. longam et 9 mm. latam subta dense tomentosolanata pubescentia contextu obrata; calycis lobi extus lanati intus glabri vel sparsissime puberulenti; corolla glabrata 7-9 mm. longa saccata fere medio; stamina parva 1.8-2.2 mm. longa duplo longiora quam latiora; stylus brevis, capsula glandulosa breviora quam et in calycem inclusa.

Climbing perennial herb or subshrub, stems branched, when young densely tomentose-lanate, becoming almost glabrous with age, nodes longer or shorter than the leaf blades. Leaves opposite or verticillate, broadly ovate-cordiform, mostly up to 1.5 cm. long, rarely up to 2.5 cm. and up to 9 mm. wide,



occasionally up to 2 cm. wide; tomentose above, very densely tomentose-lanate beneath, the pubescence completely obscuring the tissue, margins revolute, dentate, teeth large, round, apex sub-acute or acute, bases cordate, occasionally truncate or broadly obtuse, venation impressed above, sessile or subsessile; petioles when present up to 4 mm. long, very densely lanate; inflorescences dichasiate, dense, terminal or in upper leaf-axils, flower stalks not exceeding 2 cm. long, often lanate, internally glabrous or sparsely puberulent at the apex, especially when young, ovate, ca. 5 mm. long and 4 mm. wide near the base, entire, acute; corolla yellow, wholly glabrous, 7-9 mm. long, lower lip 1-2 mm. long, upper lip saccate less than one-half its length, ca. 3-4 mm. wide; anther cells equal, each pair divaricate, ca. 1.5-2.2 mm. long, about twice as long as wide, filaments ca. 2 mm. long; ovary glandular, style short, ca. 1-2 mm. long; capsule glandular, ovoid-conic, acute, shorter than and loosely invested by the calyx lobes.

This taxon will be keyed as leaves more or less than 1 cm. wide, since the largest leaves indicate the strong possibility that future collections may well have all or most leaf blades wider than 1 cm.

Cajamarca: along streamlet, above Llama, alt. 2450 m., Pennell 15924, (PH); Prov. Chota, Huambos, alt. ca. 2000 m., Soukup 4549. --Piura: Road from Huancabamba to the 3 acequias, alt. ca. 2500 m., Scolnik 1422.

This taxon is closest to C. hedera, C. aperta, and C. velutinoides Edwin, but quite readily separable from these taxa.

Calceolaria corymbosa R. & P. var. perennis Edwin, var. nov.

Differt a typica caulibus foliosis erectis elongatis internodiis gibbosis et inflorescentiis in axillis foliis superis dispositis.

Differs from the typical in having leafy, erect and elongate stems and the inflorescences in the axils of the upper leaves.

Libertad: 32 km. above Samne on road to Shorey, Prov. Otuzco, sprawling shrub on roadbanks, alt. 3110 m., Hutchison and Wright 6130 (UC, type; F; US; USM; others).

Although differing appreciably in habit, the flowers and leaves are close to the typical variety.

## CALCEOLARIA CROCEOPUNCTATA Edwin, sp. nov.

Frutex ramosus, erectus; folia subta in venis dense tomentosolanosa et textura denissima croceopunctata; inflorescentia dichasiata-paniculata; corolla lutea, labium inferum saccatum minus quam medium; antherae sagittatae, in septo acuminato; stylus 6 mm. longus.

Shrub, erect, branched, internodes distant, up to ca. 13 cm. long, about 4-6 times longer than the leaves near the base to only 2-3 times longer than the leaves below the inflorescences, current wood sparsely pubescent with recumbent white hairs, soon glabrate, bark drying smooth. Leaf blades (very) short-petiolate, ovate, mostly 2-3 cm. long and 1.0-1.3 cm. wide, crenate, acute at apex, obtuse to subtruncate at base, rugulose, sparsely puberulent above, densely tomentose-lanose on the veins and very densely punctate with sessile, shining orange punctations beneath; petiole densely lanate, up to 3 mm. long, reduced leaves often present in the axils; inflorescences paired, many-flowered, dichasiate-panicles, in the upper leaf axils of stems and branches; peduncles 2-3 cm. long, pedicles 1-2 cm. long, all flower-stalks densely lanate; flowers 13-17 mm. long; calyx lobes dimorphic on each flower, lance-elliptic or ovate, 7 mm. long and 3 mm. wide over 6-7 mm. long and 5 mm. wide, pubescent-puberulent on both surfaces; corolla yellow, minutely papillose, tuft of white hair within at the base, upper lip 4-6 mm. long, lower lip 9-12 mm. long, saccate less than one-half its length, sac only little wider than proximal part of lip; filaments 1.0-1.5 mm. long, anther cells equal, sagittate, each pair 3.0-3.4 mm. long, each cell ca. 1.2 mm. wide, an acumin developed at the apex of the septum; style ca. 6 mm. long, very long for the flower, exceeding the upper lip of the corolla; ovary glandular-pubescent, glands stalked, red; capsule broadly deltoid-ovoid, acute, vesture as the ovary, much shorter than the calyx, 3.5 mm. long and about as wide at the base.

Known only from the type.

Chachapoyas: Cerro Tinaja, alt. 3200 m. Ochoa 1686 (US).

Close to C. rugulosa Edwin, from which it differs in leaf-size, vesture (orange punctations beneath), style length and anther size and shape.

Calceolaria deflexa R. & P. var. aurantiaca Edwin, var. nov.

Frutex scandens, corolla aurantiaca differt a typica foliis ovatis plerumque minus quam duplo longior quam latior, rare duplo longior.

Climbing shrub with orange corolla, differing from the typical variety in having ovate leaves usually less than twice as long as wide, rarely reaching twice as long as wide.

Ancash: Western slope of Cordillera Negra below Paso de Collán. Rocky slopes and banks, alt. 3650 m. Pennell 15478 (PH, type; US).

CALCEOLARIA DENTIFOLIA Edwin, sp. nov.

Frutex, densissime glandulosus in lignum folia pedicellum pedunculatum et calycistubum, glandes in pubes frequenter 2-cellulosum, subsessiles vel sessiles; lamina sub-coriacea, ovata, marginibus irregulariter et acutissimo duploserratis; inflorescentia corymbosa; calycis lobi lance-elliptici ad lanceovatos, lobum anteriorum angustiorum quam ceterum, intus oscillatus, corolla magna, ad 45-50 mm. longa; loculi antherarum inaequales, magni, 6.5-7.5 mm. longi; stylus 6-7 mm. longus; capsula non visa.

Erect shrub, little branching on the upper half, wood, foliage, flower-stalks, calyx tube and calyx lobe margins densely beset with gland-tipped hair and with sessile or subsessile glands, the hair frequently 2-celled. Leaves subcoriaceous, short-petiolate, ovate, mostly 60-10 cm. long and 2-4 cm. wide, long-acute to acuminate at apex, subobtuse and dimidiate at base, margins irregularly and very sharply, doubly serrate, midvein often conspicuously elevated beneath; petioles thickened, up to 1.3 cm. long; inflorescences simple or branching, corymbose, subtended by a pair of reduced leaves, terminal on the main stem and on branches from the upper leaf-axils; basal and intermediate peduncles 2-3 cm. long; pedicels much shorter than the peduncles; calyx lobes lance-elliptic to lance-ovate, long-acute to acuminate, the anterior lobe narrower than the others, ca. 10 cm. long and 4-6 cm. wide, sparsely puberulent externally, oscillate internally, oscillae sunken; corolla large for the genus, yellow, upper lip sparsely puberulent, hooded, up to 10 mm. long, much over-topping the genitalia, lower lip 30-35 mm. long and up to ca. 25 mm. wide, saccate most of its length, externally sparsely puberulent or glandular with sessile glands, the vestiture in patches, occasionally glabrous, internally with a tuft of hair at the base; filaments about 3 mm. long, very thickened, flattened, about 2 cm. wide, anther cells unequal, large, each pair 6.5-7.5 mm. long; style ca. 7 mm. long, thickened, apically incurved; stigma enlarged or not, punctiform-capitate, ovary glutinous, sparsely glandular, glands golden, sessile; capsule not seen.

Cajamarca: Shrub, along stream E. of Cordillera de Cumulloa on road to Celendin, alt. 3400-3500 m. Pennell 15162, (US, type; PH); Cajamarca-Celendin road, km. 90, Olsson s.n., February 11, 1948. Leaves sticky.

Close to Calceolaria endopogon Kranzl. and C. salicifolia R. & P., differing from both in vestiture. In addition this taxon differs from C. engopogon in leaf-margins and in the structure of the inflorescence. Calceolatic entifolia differs from C. salicifolia also in leaf-shape and petiole length.

CALCEOLARIA FLOSPARVA Edwin, sp. nov.

Herba prostrata; caules et rami plerumque glabri; lamina longe petiolata; petiola usque ad fere longitudinem laminarum; calyx glabrus; corolla lutea 6-7 mm. longa labium superum vix brevior quam inferum; flores pedicellati; capsula ovoidea, colla nulla.

Prostrate herb, rooting at the nodes, stems and branches glabrous or almost so. Leaves mostly long-petiolate, ovate in outline, blades mostly 1.5-2.8 cm. long and 1.3-2.2 cm. long and 1.3-2.2 cm. wide, densely to thinly pulverulent beneath, irregularly coarsely dentate, laciniate-dentate and varying to with 1 or 2 pairs of lobes, the lobes irregularly laciniate-dentate; the narrowed base decurrent the length of the petioles that are at least one-half as long as the blade to almost as long; flowers axillary in upper leaves usually a pair in each axil, pedicellate, only rarely pedunculate; pedicels glabrous, 1.5-2.0 cm. long; calyx glabrous, lobes ovate, subobtusate, about 5 mm. long and 3 mm. wide, margins very sparsely crenulate; corolla yellow, glabrous, 6-7 mm. long, lower lip only little shorter than the almost wholly saccate upper lip; both anther cells fertile and much smaller than the thickened connective; style about 1.5 mm. long; capsule broadly ovoid, little shorter than the calyx, pubescent, neck lacking.

Amazonas: Rocky stream in mountain forest, alt. 3300 m. above Colcamar, Pennell 15633, (PH, type; F; US).

Thus far found only in Dept. Amazonas. In seepages, infrequent, uppermost slopes and summit of Cerros de Calla Calla, near Kms. 403-407 of Balsas-Leimebamba road, alt. 3400-3550 m., Wurdack 1711.

The combination of very small corollas with upper lip only little smaller than lower lip, almost wholly pedicellate flowers, generally glabrous inflorescence and long-petiolate leaves is not found anywhere else in this subgenus.

CALCEOLARIS GRANDIPINNATA Edwin, sp. nov.

Herba laxa, caulis pubescentiis pilis multicellulis. laminis pluripinnatis vel pluripinnatifidis, ad 23 cm. longis; nodis et

supranodis dense pubescentiis, pilis atrobrunneis; corolla glandulosa, glanderubra, sessili; capsula pubescentia, deltoideovata, collia nulla.

Soft herb, branching above the middle, stems pubescent with multi-cellular hairs and these frequently thickened and filled with a dark-brown exudate above and at the nodes. Leaves up to 23 cm. long, narrowly ovate to elliptically ovate in outline, very variable, multi-pinnate or -pinnatifid over all or most of their length, pinna sessile or less often stalked, irregularly dentate-laciniate, sometimes the upper part of the leaf merely dentate, pinnae most often reduced in size toward the apex, alternate or opposite, apically acute or long-acute, pubescent on both surfaces with multicellular hairs, these often appressed on the upper surface, long- or short-petiolate; petioles thinly connate; inflorescences simple or once-branched cymes, borne in pairs on the branches, from the axils of the uppermost leaves; basal peduncle up to 3-4 cm. long, mostly varying in length, densely and laxly gland-tipped-pubescent; pedicels pubescent as the peduncles, abruptly much shorter than the peduncles; bracts and bractioles reduced, lanceolate, otherwise leaf-like; calyx lobes broadly ovate or deltoid, ca. 3-4 mm. long and ca. 3 mm. wide in flower, becoming 9 mm. long and 6 mm. wide in fruit, acute, densely pubescent externally, less so internally, margins entire with the terminals of the veins little protruding; corolla yellow, more or less densely beset with sessile, red glands externally, 13-15 mm. long, upper lip ca. 4 mm. long, hooded, margins rounded, lower lip a little narrower than long, saccate almost its entire length, nectary small, entire hemispherical, terminal on the internally glabrous sac; one anther cell sterile, the other fertile, almost globular, the connective between the two longer than either cell and thickened, filament knoblike; style ca. 2.5 mm. long, pubescent near the base, ovary pubescent; capsule as long as or longer than the calyx, broadly triangular-ovate, pubescent, style persisting at the acute apex, neck lacking.

Type: Piura: Stream ditch, alt. 1000 m., below Canchaqui, Pennell & Ferreyra 14891, (US, type; PH;US).

Distributed in Piura near Canchaqui alt. 1000-1400 m., in wet places, Pennell and Ferreyra 14892; Ferreyra 3091.

Easily separable from all other Calceolarias by the combination of pluripinnate, very long leaves and the peculiar nodal pubescence.

CALCEOLARIA HEDERA Edwin, sp. nov.

Fruticulus scandens ligno juvenalo tomentoso, lamina subta

et pedicelli et pedunculi lanati; lamina lateovata vel interdum subrotundata margines revoluti, plerunque lateraliter 2-jugo lobarum ad apice uno lobis; flores solitarii axillarii vel in 3-flores dichasia praedita; loculi antherarum aequali distaliter apicem versus.

Climbing shrub with the lax branches and the nodes distant, young wood tomentose, tomentum decreasing with age until wood almost glabrous, foliage beneath and flower stalks densely lanate. Leaves mostly very broadly ovate in outline, less often almost subrotund, mostly up to 9 mm. wide, sometimes reaching 2 cm. wide, only very rarely exceeding 2 cm. long, mostly up to 15 mm. long, margin revolute, with usually 2 pair of lateral lobes and a single apical lobe, varying to 1 or 3 pair of laterals, lobes rounded, usually minutely cordate at base, occasionally truncate or broadly obtuse, pilose above, densely lanate beneath, the indument matted, obscuring the tissue; flower-stalks up to ca. 2 cm. long, usually less, not infrequently less than 1 cm. long, occasionally the flowers sessile: flowers solitary and axillary or in 3-flowered, simple dichasia, branches floriferous over half their length, floral leaves similar to cauline, only little reduced; the short calyx tube and lower parts of the calyx lobes externally densely tomentose, vesture decreasing to the apices of the lobes, internally sparsely pubescent, lobes elliptically, broadly ovate, ca. 6 mm. long and 5 mm. wide, acute, entire; corolla yellow, wholly glabrous or with a very few hairs internally at the base of the lower lip, 14-17 mm. long, upper lip 1-2 mm. long, lower lip saccate more than half its length, sac broadly, abruptly expanded, much wider than the non-saccate part; anther cells equal, divaricate, 2 or more times longer than wide, the up-turned distal ends furthest from the floor of the corolla, each pair of cells 2-3 mm. long, filaments about 1.0-1.2 mm. long, about half the length of the thickened 2.0-2.5 mm. long style, ovary glandular- or granular-pubescent; capsule unknown.

Known only from the type collection.

Cajamarca: springs in hills, midway between Cordillera da Cumulloo and Celendin, alt. 2700-3000 m. Pennell 15221, (US, type, PH).

The leaves are much like the common "ivy" in shape. This taxon is related to C. cordiformis and C. triloba Edwin but is most easily separable at least at present. Although most of the leaves of this taxon are less than 1 cm. wide, the largest blades indicate the strong possibility that future collections may uncover specimens whose leaves are more than 1 cm. wide.

CALCEOLARIA HUMILIS Edwin, sp. nov.

Frutex parvus, ramosus, caudex incrassatus; folia parva, omnino pulverulenta, brevipetiolata ovata usque ad 1.5 cm. longa et 0.9 cm. lata crenulata-serrulata plana; corolla 9-11 mm. longa. labium superum annulo reductum, inferum saccata minus quam medio, pars proximo fera lato quam distalo; stamina parvis, antheris aequalis divergentis vel divaricatis 2 mm. longis et 1 mm. latis.

Small, branched shrub from a thickened rootstock, several stems rising closely grouped, lower nodes longer, upper sometimes shorter than the small leaves, wood drying wine-red, puberulent as the pedicels and calyx lobes. Leaves small, ovate, up to 1.5 cm. long and 9 mm. wide, short-petiolate, pulverulent on both surfaces and often puberulent above, yellow-green, glandular beneath, crenulate-serrulate, plane, acute at apex, subacute to subobtuse at base, widest near but not at the base, venation subobsolete and impressed above, prominent and elevated beneath, often with flattened, white puberulence; flowers solitary, crowded, axillary to upper leaves and terminal on the branches and stems; pedicels reddish under the white puberulence, ca. 1 cm. long; bracts leaf-like, reduced; calyx lobes ovate, 3-4 mm. long and almost as wide at base, internally puberulent on the red margins, yellow-green glandular on the light green tissue, acute; corolla yellow, 9-11 mm. long, upper lip reduced to a ring less than 1 mm. long; lower lip papillose on both surfaces, saccate less than one-half its length, the proximal part only little narrower than the distal, saccate part; filament ca. 1 mm. long, thickened; anther cells equal, divergent or divaricate, each pair 2 mm. long and 1 mm. wide; style ca. 1.0-1.5 mm. long, thin; ovary papillose-glandular; fruit not seen.

Cajamarca: Open jalca, southwest slope, Paso de Gavilán, S. of Cajamarca, alt. 3100-3300 m., Pennell 14953 (PH); Bushy ravine on Jalca, southwest slope, Paso de Gavilán, S. of Cajamarca, alt. 3100-3200 m., Pennell 14951. --Ancash: Matahuanca, ca. 20 km. S. of Huaraz, alt. 4000 m., Rick s.n.

Close to *C. inamoena* Kranzl. which differs in having flowers in dichasia, much more deeply toothed or lobed leaves and very different indument.

CALCEOLARIA HUTCHISONII Edwin, sp. nov.

Herba erecta, ramosa, caules et rami densissime puberulenti superi, sparse puberulenti ad subglabri infer; lamina latissime ovata, frequenter latior quam longior, plerumque 0.8-2.0 cm. longa et 1.0-2.2 cm. lata, dentes distanter crenatidentati, subcoriacei, densissime brevissime puberulenti superi, denissime pulverulenti inferi; inflorescentis 1-2x ramosa; et pedunculi et pedicelli usque ad 1.0 cm. longi et bractea et bracteola

deficiens; corolla extus dense papillosa-glandulosa; stamina parva, filaments vix 0.5 mm. longa, antherae ca. 2.5 mm. longae, loculi equales, divergenti, longiores quam latiores.

Erect branched herb to 1.5 m. tall, stem drying red-brown, striate on upper part, closely puberulent above to sparsely so or almost glabrous below. Leaf blades very broadly ovate, sometimes to often wider than long, the longest up to 2.5 cm. long, mostly 0.8-2.0 cm. long, and 1.0-2.2 cm. wide, narrowed apically, very broadly obtuse basally, margins coarsely, irregularly crenate-dentate, teeth usually few, distant, densely and closely puberulent above, densely tomentulose-pulverulent beneath, drying dark-green above, much paler beneath, subcoriaceous, short-petiolate; petioles densely pubescent, up to 6.0 mm. long, thinly connate across the nodes; inflorescences paired, from the uppermost leaf-axils, usually in irregular, 1-2x branched, subcymose clusters; flowers-stalks short, often less than 1 cm. long, densely puberulent, bracts and bracteoles lacking; calyx lobes ovate, 4.0-4.5 mm. long and 3.0-3.5 mm. wide, acute to obtuse, densely, closely puberulent on both surfaces, calyx tube puberulent; corolla yellow, densely papillose-glandular externally, 13-17 mm. long, upper lip annulate, 2-3 mm. long, lower lip saccate about half its length, internally proximally beset with long, white hair; stamens very small, filaments hardly 0.5 mm. long, anthers ca. 2.5 mm. long, cells equal, divergent, a little longer than wide; style 1.5-2.0 mm. long, very thickened on lower half, incurving to the upper lip from its base; ovary glandular; capsule not seen.

Piura: Huancabamba Prov., 18.5 km. above Huancabamba, on road W. to Piura, alt. 3200 m., Hutchison and Wright 6630, (F, type; UE; US; USM).

Piura: El Tambo, road between Piura and Huancabamba, alt. ca. 3000 m., Scolnik 1407; Above Huancabamba alt. 3200-3300 m., Weberbauer 6048.

The very short filaments, very broad leaves, compound inflorescences and very thickened style form a combination of characters not seen in any other species in the genus.

CALCEOLARIA LEUCANTHA Edwin, sp. nov.

Differt a Calceolaria ballotifolia Kränzl. frutex scandentis glabris inflorescentiis excepte, laminis subtis rubropunctis parvior quam C. ballotifolia; labiis inferis corollae saccatis ca. one-third eis longitudinis.

Differing from C. Ballotifolia Kränzl. to which it is very closely related in the following ways; wood and foliage glabrous,



leaves 0.8-5.5 cm. long and 0.5-1.6 cm. wide, densely red-punctate beneath; lower lip of the corolla saccate only about one-third its length.

Tall shrubby climber, glabrous except for the peduncles, pedicels and calyces, older wood unisulcate. Leaves ovate, very coarsely dentate, asymmetrical, acute at apex, obtuse to sometimes cordate at base, short-petiolate; inflorescences dichasiate or corymbose, few-flowered, terminal on the branches or in upper leaf axils; basal peduncles 3-5 times longer than the remaining flower stalks; calyx tube and the lower part of the lobes pubescent; corolla white, drying yellow.

CALCEOLARIA LINEARIOIDES Edwin, sp. nov.

Frutex, erectus vel ad apicem nutans. Lamina latelinearia vel anguste-ellipticeovata 4-8 mm. lata, manifeste venosa et supera et infera; inflorescentia racemosa vel racema; pedicelli 1-2 cm. longi; lamina interfloralia minus quam caulina; anthers 4-5 mm. longis 2-3 plo longiora quam latiora, loculi inaequales, divergenti; capsula quam calyx longior, puberulenta, angustata ad collum longum apex obtusus.

Shrub, erect or apically nodding, stems and branches densely puberulent or sometimes also glandular-puberulent. Leaves puberulent on both surfaces, more so beneath, short-petiolate, broadly linear or narrowly, elliptically ovate, 1.0-2.5 cm. long and 4-8 mm. wide, margins few-serrulate on the upper half, often thinly revolute, apex acute or subacute, base acute or long-acute, venation visible, impressed above, elevated beneath; petioles ca. 1 mm. long, vesture as the blades, those of the stem and principle branches swollen and often with reduced leaves or abbreviated shoots in the axils; inflorescences racemose or true racemes, borne in upper leaf-axils; pedicels puberulent, ca. 1-2 cm. long; interfloral leaves reduced, otherwise as the cauline; calyx lobes sparsely puberulent on both surfaces or internally glabrous, broadly ovate, acute 4-5 mm. long, almost as wide near the base; corolla yellow, sometimes red-marked within near the base, upper lip 2-3 mm. long puberulent or papillose, lower lip glandular-puberulent beneath on the non-saccate proximal part or papillose beneath along its length, sometimes with a tuft of long white hairs at the base within, ca. 11-15 mm. long, saccate a little less than half its length; anthers large for the corolla, 4-5 mm. long, cells unequal, 2-3 times longer than wide, divaricate; style 2-3 mm. long, apically curved, ovary puberulent or sparsely glandular with fugitive glands; capsule ovoid, a little longer than the calyx, puberulent, narrowed to a long neck, apex obtuse.

Pasco: Yanahuanca, northwest slope, alt. ca. 10,000 ft.,

Macbride Featherstone 1184 (F).

Cajamarca: Dry banks (volcanic soil), alt. 2900 m., 15-20 km. above Cajabamba, Pennell & Ferreyra 14855.

Very close to Calceolaria linearis R. & P., differing only as in the key. The species is proposed also because of the distance between the two collections, possibly indicating wider occurrence in North Central Peru.

CALCEOLARIA LONGIINTERNODIA Edwin, sp. nov.

Herba alta, pauciramosa ad apicem, internodia ca. 4-5 plo longiores quam lamina; laminae oppositae vel ternatae, angustovatae ad lanceovatae, dense tomentosae, marginibus valde dentatis; calycis lobi 7-9 (-10) mm. longi; corolla 24-30 mm. longa; anthera interdum dimorpha, plerumque 2 plo longior quam latior.

Tall herb, branching near the apex, branches swollen at base, nodes, especially the lower, several times (ca. 4-5x) longer than the largest leaves, stems drying dark to purple-brown, striatulate, mostly glabrous except hirsute-puberulent in the inflorescence; leaves opposite or ternate, blades narrowly ovate to lanceovate, densely tomentose and pale-green beneath, glabrous, darker and dull-green above, very variable in size, the major leaves 4-6 cm. long and usually 1.5-3.0 cm. wide, margins very coarsely dentate, apex long-acute, variable at base; petioles up to 6 mm. long, densely tomentose, often with abbreviated shoots or reduced leaves at base in the axils; peduncles and pedicels densely tomentose, the longest peduncles ca. 4.5 cm. long, once or twice branching, forming dichasia, pedicels about half as long or less than half as long as the peduncles; inflorescences on upper part of stem, terminal on the branches; calyx lobes broadly ovate, 7-9(-10) mm. long, acute, entire, externally densely puberulent, internally puberulent with a row of hairs near the margin; corolla yellow, 25-30 mm. long, upper lip ca. 4-6 mm. long, lower lip externally pustulate, internally with a tuft of hair at the base, 21-24 mm. long, saccate less than half its length; anthers on short filaments, cells equal or a little unequal, sometimes dimorphic in a flower, mostly at least 2 times longer than wide, less often only little longer than wide to almost as wide as long, each pair of cells 4.5-5.5 mm. long; style a little thickened, erect, ca. 4 mm. long; ovary glandular.

Ancash: Herb, banks near stream Tinco, alt. 3400-3650 m., E. slope of Cordillera Negra opposite Huaraz, Pennell 15468, (US, type: PH).

Close to C. impressifolia Edwin, from which it differs in

leaf and anther shape and C. hirsutula Pennell and C. bicrenata R. & P. The former very fine teeth and the latter differs in leaf-shape. C. longiinternod differs from all other Calceolarias in the combination of dimorphic anthers, leaves about three times as long as wide with coarsely dentate margins and calyx lobes usually 7-9 mm. long with a distinct row of hairs internally near the margins.

CALCEOLARIA LOPEZII Edwin, sp. nov.

Herba erecta, mollis, caules, rami, pedunculi et pedicelli dense pubescenti, pubis glandulosis, glandules parvula et plerumque caduca. Inflorescentia dichasia; calycis lobi intus glabri, venae parallelae; corolla glabra, labium superum plus quam medio labium inferum; filamenta ca. 4 mm. longa; anthera bilocularia; stylus glabrus elongatus, 4.5-5.0 mm. longus; stigma parvissima; ovarium in sicco atrorubrum.

Soft erect herb, branches and leaves opposite, stems branches and flower-stalks more or less densely pubescent with gland-tipped hairs, glands small and frequently fugitive in age, hairs white of intermixed, varying sizes, upper nodes bearing densest vesture. Uppermost leaves sessile, others short-petiolate, blades ovate, mostly 2.8-4.1 cm. long, sometimes shorter, and 2.0-3.8(-4.4) cm. wide, sometimes narrower, dentate-denticulate, apex acute, base obtuse to truncate, occasionally cordate, subglabrous to sparsely puberulent with 2-celled hairs, mostly concentrated on the margins and the veins above, chartaceous, a little paler beneath than above, both surfaces dull green; petioles only 1-2 mm. long, rarely a little longer, vesture denser than the blades; inflorescences termination on stem and axillary or terminal on the branches with a pair of reduced bract-like leaves at the base of the peduncle, simple or branched dichasia; calyx lobes externally sparsely pubescent, margins ciliate, internally glabrous, main veins parallel, ovate to elliptical, 2.3-3.0 mm. long and 1.2-2.0 mm. wide, acute; corolla yellow, 12-22 mm. long, almost completely glabrous, upper lip more than half the length of the lower, 7-8 mm. long, lower lip 11-13 mm. long and 7-9 mm. wide, saccate about half its length; filaments about 4 mm. long, flattened, with one main vein, anthers bilocular, locules very small, each anther about 1 mm. long, usually smaller, a little longer than wide; style glabrous, elongate, 4.5-5.0 mm. long, thin, stigma very small, scarcely wider than the style, ovary drying dark red; capsule not seen.

Livertad: Cerro Campana, Prov. Trulillo, alt. 500 m., August 9, 1948, Lopez 0221, (US); Same location August 21, 1949, 420 m. alt., Angulo 0698.

Close to Calceolaria utricularioides Benth., differing in

having deeper teeth on the blade margins, shorter filaments and in the development of an inflorescence. This latter only rarely seen in C. utricularioides.

CALCEOLARIA LUTEOCALYX Edwin, sp. nov.

Frutex scandens; lamina ovata vel ellipticeovate; petioli 8-18 mm. longi; inflorescentia ad basim dichotoma ramosa, ultimi rami cymosi; bractea foliosa; pedunculus basalus 5-9 cm. longus, intermedii ca. one-half - two-thirds quam basali; pedicelli vix breviores quam intermedii pedunculi; calyx luteus, lobi interdum latiores quam longiores; corolla glabra, saccata minus quam media, pars provima vix angustior quam distala; antherae subsessiliae, aequales.

Climbing shrub, main branches and stem canaliculate at least part way, young wood densely, older wood sparsely puberulent. Leaves petiolate, blades ovate or elliptic-ovate, mostly 2.0-4.0 cm. long and 1.5-2.2 cm. wide, usually not twice as long as wide, narrowed at both ends, margins coarsely, irregularly serrate-dentate; petioles densely pubescent, mostly 0.8-1.8 cm. long, basally little thickened and thinly connate across the nodes that are frequently much longer than the leaves; inflorescences arising from the upper leaf-axils, basally dichotomously branched, ultimately 3-flowered cymes, basal branching sometimes wanting, then the inflorescences simple or once-branched cymes; bracts and bractlets foliose, reduced; basal peduncles 5-9 cm. long, secondary peduncles ca. one-half - two-thirds as long as the basal; pedicels little shorter than secondary peduncles, flower-stalks densely puberulent; calyx yellow, lobes subglabrous, sometimes broader than long, broadly ovate, obtuse, 7-8 mm. long and 7-9 mm. wide, margins sinuate or irregularly broadly crenulate and sparsely ciliolate, calyx tubes sparsely to densely puberulent; corolla yellow, wholly glabrous, upper lip 3 mm. long with hood 1 mm. long, lower lip 18-22 mm. long, saccate less than half its length, proximal, non-saccate part only little narrower than distally; anther cells equal, ca. 2 mm. long, divaricate, subsessile, filaments ca 0.3-0.5 mm. long and about as wide; style ca. 2.5-3.0 mm. long, thickened, ovary pubescent, flattened; capsule not seen.

Known only from the type of collection.

Amazonas: Forest, alt., 3000 m. Cerro Puma-urco, SE. of Chachapoyas, Pennell 15549, (PH, type; PH).

This species differs from all other taxa in the genus by virtue of the following combination of characteristics: calyx yellow, with lobes often wider than long, non-saccate part and the anthers subsessile.

## CALCEOLARIA MACULATA Edwin, sp. nov.

Herba scandentia ramis oppositis, ramulis et ramis juvenalis dense pubescentis veteribus dense puberulentis. Folia brevepetiolata subtus dense ferruginea, eglandulosa, tomentosa, supra pilis brevioribus pubescentis plerumque glandulosis; nodosa indurate; calycis lobi extus dense pubescentis, intus pilis marginatis aggregata; corolla intus rubro-vel ferrugineo-maculata, labium inferus saccata solus one-third ad one-fourth ea longitudina, distaliter 2-sulcata, saccus 3-lobatus; antherarum loculi aequales; capsula quam calyx brevior.

Climbing herb with opposite branches, young stems and branches densely pubescent older densely puberulent, internodes longer than the leaves. Leaves short-petiolate, densely eglandular, ferruginous-tomentose beneath, densely pubescent above with shorter, frequently glandular hairs, ovate, grossly dentate, apex acute, base broadly obtuse to subtruncate, mostly 1.8-3.0 cm. long and 1.0-1.9 cm. wide; petioles up to ca. 8 mm. long, densely pubescent, those of the stem leaves thick, indurate, woody, persistent, with the branches forming swollen nodes; flowers clustered at the apices of the upper branches in irregular cymose or corymbose inflorescences; bracts and flower-stalks densely pubescent; basal peduncles up to 3 cm. long, intermediate peduncles and pedicels much shorter, frequently less than half as long; calyx lobes ovate, acute, 5.0-6.5 mm. long, almost as wide at base, externally densely pubescent, internally with a thick row of short hairs along the margins and a few scattered hairs on the lower third; corolla yellow, the internal surface of the lower lip red-brown marked or spotted and with a tuft of long white hair at the base, mostly 19-23 mm. long, less than half as wide, upper lip up to 2.5 mm. long, lower lip beneath externally sparsely puberulent, 16.5-22.0 mm. long, saccate only about one-third to one-fourth its length, the sac at the distal end with 2 short sulcations therefore appearing 3-lobate; stamens glabrous, filaments ca. 1.5 mm. long, anthers ca. 3 mm. long, cells equal, almost twice as long as wide; style 1.5-2.0 mm. long, erect or little curved at apex, glabrous, most often thickened; ovary glandular with sessile, golden glands; capsule ovoid, obtuse, glandular, shorter than the calyx.

Known only from the type collection.

Cajamarca: Meadow E. of Celendin, alt. 2500-2700 m.,  
Pennell 15215 (US type; PH).

This very distinct taxon is probably close to C. aperta Edwin, but easily distinguished from it. The corolla is very unusual.

## CALCEOLARIA PALLASCENSIS Edwin, sp. nov.

Frutex dense lanosus. Lamina aggregata in nodis incrasatis linearia vel acicularia; inflorescentia simplex, cymosa; corolla lutea 7-11 mm. longa, labium superum minus quam duplo longior inferum; loculi antherarum fere orbiculari, inaequales, divarticati, filamenta perbrevia.

Erect, strictly branching from about the middle, mostly densely white-lanate nodose shrub, stems very densely lanate above, vesture decreasing basally, thickened at the closely spaced nodes. Leaves a little shorter to a little longer than the internodes, with the branches and flower-stalks strictly pointing upward, almost parallel to the main stem, sessile, linear or aciculiform, mostly 0.5-1.5 cm. long up to 2 mm. wide, densely lanate in the groove of the costa and varying to densely puberulent-pustulate on the tissue, the puberulence minutely gland-tipped, the bases of the outermost leaves at each node thickened, mostly with very abbreviated shoots in the axils, the leaves appearing clustered, occasionally the shoots a little elongated, margins revolute, entire, apex hammate, tissue thickened, venation obsolete; inflorescences terminal on the main stem and branches and in the uppermost leaf-axils, simply cymose; pedicels 5-10 mm. long, densely lanate; calyx tissue thickened, calyx lobes externally densely lanate, internally glabrous or minutely glandular-puberulent, or with a line of hairs near the margin, 3 segments broadly ovate, the fourth segment elliptically ovate, 4.0-4.5 mm. long and ca. 3.0 mm. wide or 5.0-5.5 mm. long and 2.0 mm. wide, all acute; corolla yellow, glabrous or often minutely puberulent, 7-11 mm. long, upper lip 3-4 mm. long, hooded but not obscuring the genitalia, lower lip saccate about half its length, sac distally crenulate, internally glabrous; anther cells large for the corolla on very short filaments, divaricate, unequal and almost orbicular; style 2.5-4.5 mm. long, curved; ovary granular; fruit not seen.

Known only from the type.

Ancash: Laguna de Pelagatos, Prov. Pallasca, 4300 m. alt., Lopez 2400, (LA).

Unequal almost orbicular anther cells are rare in the genus. This characteristic along with the very small corolla, simple inflorescence, dense woolly vesture and very narrow leaves aggregated in nodose masses renders the taxon quite distinct.

## CALCEOLARIA PHACELIAEFOLIA Edwin, sp. nov.

Petiola one-third - one-fourth longitudina ad fere longitudina laminarum; margina laminarum 2-4-jugis lobarum; pedunculi, pedicelli et calycis lobi puberulenti, pilis glandulosis;

inflorescentia irregulariter ramosa, pauci-ad pluri-floribus, corymbosa vel paniculata, rami ultimi cymosi vel dichasiati; labium inferus corollarum saccatus minus quam medio ea longitudinarum; antherarum loculi plerumque inaequales, una ea seape fere obsolita, rarissime loculi aequales; capsula brevior quam calyx, glandulosa.

Subshrub drying back to near the ground or occasionally an herb or small shrub, usually branching over much of its length, younger stems puberulent, often with mixed glandular eglandular hair, older stems at length glabrate. Leaves petiolate, ovate in outline, very variable in size, mostly 1-3 cm. long and 0.8-2.5 cm. wide, in herbaceous material up to 6 cm. long and 5 cm. wide, margins with 2-4 pairs of irregular lobes, these sometimes secondarily toothed, long acute at apex, obtuse to subtruncate at base, puberulent above and beneath with gland-tipped hairs; petioles sometimes almost as long as the blades, most often one-third - one-fourth the length of the blades, glandular-puberulent to -pubescent; inflorescences variable, corymbose to paniculate, when paniculate, the ultimate branchings cymose or dichasiate, few- to many-flowered, usually terminal on the branches; bractlets very reduced, leaf-like, ca. 0.5 mm. long, lobes short, 1-2 pairs; basal peduncles 3-10 times longer than the remaining flower-stalks, peduncles and pedicels gland-tipped-puberulent, sometimes densely so; flowers variable in size, 22-40 mm. long when dry, only up to one-half as wide; calyx lobes ovate, acute, 7-9 mm long and 4-6 mm. wide, internally and externally gland-tipped-puberulent; corolla yellow, 20-34(-38) mm. long, externally sparsely to densely very short-puberulent, the hairs gland-tipped, upper lip very short, ca. 2-4 mm. long, not hiding the stamens and stigma, lower lip 20-35 mm. long, distally saccate less than one-half its length, the proximal part abruptly much narrower than the upcurving sac, internally long-pubescent with white hairs at the base; stamens with filaments ca. 1.5-2.5 mm. long, anther cells unequal or very rarely equal, saggitate, the larger of each pair about 3 mm. long and 1.0-1.5 mm. wide, the other cell from subobsolete to about three-fourths as large, often varying from flower to flower on a single plant, when almost lacking reduced to a sterile flap at the apex of the filament, the stamen appearing uniloculate unless magnified (ca. 30x); style erect, 2.5-3.0 mm. long, ovary glandular; capsule ovoid, little shorter than the calyx, apically narrowed, style persisting.

Ancash: Shrub; bushy banks, alt. 3200-2500 m., N. of Chancos, Pennell 15320, (US, type; PH).

Ancash: Tranca, near Chiquian, alt. 3220 m., Ferreya 5691; Capillapunta, mountain S. of Chiquian, alt. 3540 m., Ferreya 5732; Mountain E. of Chiquian, alt. 3500-3550 m., Ferreya 7334; 7342 (herbaceous); Marcara, Prov. Huaraz, alt. 3000 m.

Nunez 3234; stream bed, S. of Huaraz, alt. 3100 m., Pennell 15263; Monterrey, 3 km. below Huaraz, alt. 3000-3100 m., Pennell 15309; Bushy, rocky slope along stream, S. of Río Santa, alt. 3100-3150 m., opposite Huaraz, Pennell 15328; Sandy banks, alt. 3400-3450 m., Cerro Shaurena, SE. of Huaraz, Pennell 15352; Low mountain toward El Huascaron, N. of Yungay, alt. 2850-2900 m., Pennell 15422 (anther cells equal); Summit of Cerro Shaurema, SE. of Huaraz, alt. ca. 3500 m., Pennell 15428; Bed of Quebrada de Huaqui, alt. 3000-3050 m., N. of Huaraz, Pennell 15436; Hills N. of Huaraz, alt. 3100-3150 m., Pennell 15438; Jalca, E. of slope of Cordillera Negra, opposite Huaraz, alt. 3600 m., Pennell 15464. -- Lima: Chicla between San Mateo and Casapalca, alt. 3700 m., Ferreyra 6515; Rimac Valley, alt. 4000 m., Rauh-Hirsch P1794.

This species is easily separated from the other members of the genus by the combination of very unequal anther cells, deeply lobed leaves, long petioles and the irregularly varying inflorescence.

CALCEOLARIA SEUDOSCABRA Edwin, sp. nov.

Caules et rami glanduloso puberulenti; lamina glandulosa vel eglandulosa, sessiles vel brevipetiolati, 2.0-3.5 cm. longi et 1.0-2.1 cm. lati; inflorescentia cymosa, paucifloribus; labium inferus corollarum extus brevi-glanduloso-puberulentum; loculi antherarum inaequales, divericati saepe duplo langior quam latior; ovarium glandulosum; capsula ignota.

Coarse perennial herb, erect and branched, foliage, stems and branches drying brown, stems and branches glandular-puberulent. Leaves mixed glandular and eglandular-puberulent, sessile or less often short-petiolate, ovate to broadly elliptically ovate, mostly 2.0-3.5 cm. long and 1.0-2.1 mm. wide, margins revolute, crenate, narrowed to an obtuse apex, base broadly obtuse, tissue scabrous, costa elevated and prominent beneath; young inflorescences arising in pairs from the upper leaf-axils, cymose, few-flowered; peduncles glandular-pubescent, 2-5-times longer than the pedicels; bracts and bracteoles reduced floral leaves, bracts occasionally with a pair of lobes near the base; calyx lobes mixed glandular- and eglandular-pubescent on both surfaces, elliptic-ovate, long-acute, 4-5 mm. long and ca. 3.5 mm. wide; corolla yellow, upper lip glabrous, 1-2 mm. long; lower lip externally short-glandular-puberulent, saccate over most of its length, 13-15 mm. long and about 5 mm. wide, a tuft of white hairs present at base within; stamens short, anthers large for the small corolla, anther cells divaricate, unequal, usually at least twice as long as wide, the larger 1.8-2.0 mm. long, the smaller 1.2-1.5 mm. wide; style ca. 1.5 mm. long, thickened; ovary glandular; capsule unknown.



Cajamarca: Wet place, alt. 2700-29-- m., mountain E. of Celendin, Pennell 15213 (PH).

Closest to Calceolaria Scabra and C. variefolia, differing from the former in being a much coarser plant with larger leaves and from the latter in having the internodes much shorter as well as in growth form, herb as opposed to shrub.

CALCEOLARIA PUMILA Edwin, sp. nov.

Herba minima annua, dense glanduloso-pubescentia; caudex simplicissimus usque ad 6 cm. altum, 3-jugis foliorum opposita disposita; folia oblonga vel ovata, integra, sessilia, usque ad 1.2 cm. longa et 0.8 cm. lata, plerumque 0.9 cm. longa et 0.7 cm. lata, utrinque puberulenta-pubescentia; flores solitarii, terminali vel in axillaribus foliorum disposita flavi minimi, 7 mm. longi et 2-3 mm. lati; calycis lobi elliptici extus glandulosi, 3.0-3.5 mm. longi et 1.5-2.2 mm. lati; corolla lutea, labium superum 2 mm. longum, inferum 5 mm. longum, saccata lateraliter in toto longitudinum, medio fere 0.5 mm.; capsula elliptica longior quam calyx.

Tiny unbranched herb up to 6 cm. tall, the simple stem densely glandular-pubescent, bearing 1-3-pairs of oblong or ovate leaves. Leaf-blades sessile, entire, up to 1.2 cm. long and 0.8 cm. wide, usually reaching 0.9 cm. by 0.7 cm., puberulent-pubescent on both surfaces; flowers solitary, pedicellate, terminal or in the upper leaf-axils, tiny, up to 7 mm. long and 2 mm. wide, below; pedicels short, up to 7-8 mm. long, glandular-pubescent; calyx lobes elliptical, acute, 3.0-3.5 mm. long and 1.5-2.2 mm. wide, externally glandular-pubescent; upper lip of the glabrous corolla ca. 2 mm. long, lower lip 5 mm. long, sac laterally placed the length of the lip but only about 0.5 mm. thick medianly from the distal end; stamens very small, filaments thickened, less than 1.0 mm. long, anther cells equal, drying white to light yellow, each anther ca. 1.0-1.2 mm. long, each cell a little longer than wide, divaricate; style thickened, ca. 1.0 mm. long, ovary sparsely glandular-puberulent; capsule elliptical, sparsely glandular-puberulent, 6.0-6.5 mm. long and 2.0-2.5 mm. wide, much exceeding the calyx.

This taxon has the smallest flowers of any in Peru.

Known only from the type specimen.

Cajamarca: Rocky limestone on ridge 11 km. S. of Cajamarca, alt. 2750-2850 m., Pennell and Anderson 15078 (PH).

Since the sheet is not marked unicate isotypes are probable.

A unique taxon in the genus, at least in Peru. No close relative is known at this time.

CALCEOLARIA REICHLINII Edwin, sp. nov.

Differt a *C. cajabambae* Kranzl. densissimis argenteolanatis laminis et caycis-lobis, laminis plerumque linearis interdum lanceovatis marginibus plerumque integris; pedicellis et pedunculis usque ad 2 cm. longis; caycis-lobis intus glabris vel subglabris; corollis extus glabris vel pauciglandulosis, stylis 2-4 mm. longis et ovarii glandulosopubescentiis vel longi-pubescentiis vel raro pauciglandulosis.

Shrub erect and branched, wood, leaves, flower-stalks and calyces more or less densely beset with long, silvery, soft hairs (lanate), the leaves beneath and the calyx lobes most densely so, the vestiture sometimes fugitive with age, usually eglandular except occasionally for the corolla and frequently the ovary. Leaves most often linear or aciculiform, occasionally broadening to lance-ovate, sessile or almost so, the vestiture frequently completely obscuring the tissue beneath, margins mostly entire, revolute, obtuse apically, blades sessile; inflorescences 1-few flowered; flower stalks up to 2 cm. long, usually less; calyx-lobes elliptical or elliptically ovate, rarely ovate, 5-8 mm. long, and up to 4 mm. wide, acute, the tissue frequently completely obscured by the vestiture externally, glabrous or sometimes with a few hairs paralleling the margins or very rarely a few-glands present internally; corolla yellow, variable in size, 12-25(-28) mm. long, externally glabrous or few-glandular, rarely papillose, saccate more than one-half its length, internally glabrous; anther cells unequal, 2 or more times longer than wide; completely divaricate, each pair of cells up to 4 mm. long, septum thickened; style 2-4 mm. long, glandular at base; ovary glandular-pubescent or long-pubescent, rarely merely few-glandular; capsule narrowly conic-ovoid, about as long as the calyx, vestiture as the ovary, apex attenuate, style persisting.

Common in Dept. Cajamarca, in the Andes of northern Peru and 3 collections also seen just to the south in Dept. Libertad.

Cajamarca: Dry banks, (volcanic soil), 15-20 km. above Cajabamba, alt. 2900 m., Pennell & Ferreyra 14853, (PH, type; US); prov. Cajabamba, km. 38 N. of Huamachuco, near Cajabamba, alt. 2900-3000 m., Ferreyra 3044; on cumbre above Cajamarca, 3500 m. alt., Olsson 4 pro parte; Celendin-Balsas road-km. 124, Olsson 4a; mountain E. of Celendin, alt. 2700-3000 m., Pennell 15173; alt. 2400-2800 m., Pennell 15177; Rocky calcareous hillside, NE. of Cajamarca, alt. 2750-3850 m., Pennell & Anderson 15082; Cliff about 10 km. above Cajamarca, alt. 3200 m.,

Pennell & Ferreyra 14865; Open jalca, Paso de Gavilan, S. of Cajamarca, alt. 3000-3300 m., Pennell & Ferreyra 14959; Jalca SW. of Cajamarca, alt. 2700 m., Pennell & Reichlin 15034; alt. 2750-4000 m., on the Cajamarca-Celendin road, Scolnic 1308. -- Libertad: 2-3 km. above Otuzco, Trujillo-Otuzco road, alt. 2500 m., Ferreyra 2977; Sandy area, S. of Stuzco, alt. 2500 m., Pennell & Ferreyra 14820; km. 82 W. and below Agallpampa, alt. 2900 m., Pennell & Ferreyra 14832.

CALCEOLARIA RUGULOSA Edwin, sp. nov.

Lamina rugulosa vel rugosa dense pubescentia praecipue subta, petioli perbrevis incrassati brevis connati lignosi, corolla usque ad 1 cm. longa perbrevis saccata, stamina brevissima loculi antherarum aequales.

Erect, branched, pilose-tomentose shrub, stems appressed-pilose below, tomentose above, and with the leaves drying light brown, the leaves also sometimes drying brown-green, tomentum densest on young growth. Leaves opposite or ternate, ovate or elliptic-ovate, occasionally elliptical, (1.5-)3.0-5.0 cm. long and (1.0-) 2.0-3.5 cm. wide, margins plane, serrate to double serrate, sometimes grossly so, narrowed to an acute apex, obtuse to broadly obtuse at base, rugose or rugulose, pilose above, tomentose beneath, sometimes, especially when young, the vestiture obscuring the leaf tissue, often with golden yellow glands intermixed beneath; petioles 1-4(-6) mm. long, thickened, woody, densely tomentose, usually narrowly connate; inflorescences in upper leaf-axils and also terminal, many-flowered, compound dichasia or corymbose; flower-stalks densely long-soft-pubescent; bracts merely reduced leaves; calyx tube and lobes densely pilose externally, glabrous internally, lobes ovate or broadly ovate, acute, 6-8 mm. long; corolla yellow, up to 1 cm. long, externally very short-puberulent, internally glabrous; upper lip 1-2 mm. long; lower lip ca. 6-8 mm. long, saccate only 1-2 mm.; anther cells equal, each pair ca. 2.0-2.2 mm. long, almost twice as long as wide; style thin, glabrous, 1.0-1.5 mm. long, ovary glandular; capsule ovoid-conic, a little shorter and loosely invested by the calyx, apically long-acute, sparsely golden glandular.

Cajamarca: rock cliff below Llama, alt. 1800-1850 m., Pennell 15917, (US, type; PG); earth bank, Llama, alt. 1850 m., Pennell 15916.

This taxon is related to C. aperta Edwin, but it is morphologically quite distinct.

CALCEOLARIA SIMULANS Edwin, sp. nov.

Herba parva, erecta ad repens. Lamina supera pinnata vel duplopinnata; inflorescentia pauciflos simplex vel semel ramosa; corolla lutea, glabra, labium superum 1.5-2.5 mm. longum inferum 9-11 mm. longum, saccata plus quam medio; antherae parvae, loculi aequans vel minima inaequans contigui jugum 1.3-1.7 mm. longum divaricatum longior quam latior nigrum ad septum; capsula quam calyx longior sparse glandulose-puberulenta, colla elongata.

Herb, erect to repent, little-to much-branched, usually up to 25 cm. tall, sometimes only about 10 cm., upper parts of the stems and branches more or less densely glandular- and eglandular-pubescent, remaining parts of stems and branches glabrous to sparsely eglandular-pubescent; upper leaves once or twice pinnate, lower very variable, from dentate to lobed; pinna dentate, sparsely mixed pubescent beneath as the upper parts of the stems and branches; petioles 1-4 mm. long, pubescent as the lower surfaces of the pinnae; inflorescences terminal on the branches and stems, simple or once-branched, few flowered; bracts foliose, reduced; flower-stalks up to 2.5 cm. long, usually not exceeding 1.8 cm., vesture as the upper parts of the branches; flowers yellow, small for the genus; calyx lobes a little unequal, broadly ovate, 4-5 mm. long and 3-4 mm. wide, acute, venose on both surfaces, red at base, sparsely glandular-puberulent on the sinuate margins; corolla yellow, dark-brown dotted, glabrous, ca. 10-13 mm. long, upper lip 1.5-2.5 mm. long, lower lip 9-11 mm. long, saccate a little more than half its length, proximal, non-saccate part only little narrower than the distal, saccate part; stamens contiguous, small, anthers ca. 1.3-1.7 mm. long, little shorter than the filament, cells equal or slightly unequal, divaricate, little longer than wide, blackened basally near the septum; style very short, up to 1 mm. long, apically curved; capsule sparsely glandular-puberulent, longer than the calyx, lance-ovoid, abruptly narrowed to a long neck.

Ancash: Casca below Chiquian, Prov. Bolognesi, alt. 3100-3200 m., Ferreyra 7307 (US).

Distributed sporadically from Ancash to Ayacucho and Ica.

Ancash: Chacchash near Chiquian, 3220 m. alt., Ferreyra 5687. --Ayacucho: Pampalca between Huanta and Rio Apurimac, 3200 m. alt., open hillside, Killip & Smith 22210. --Ica: Pisco Valley, alt. 2900 m., Rauh-Hirsch P390. --Lima: Rio Blanco, wet E. slope, alt. ca. 15,000 ft., Macbride 3037.

This species has the foliage of subgenus Calceolaria and flowers of subgenus Cheiloncos. It is provisionally palced in the latter grouping. In Peru, thus far, this is the only known taxon bridging the subgenera.

## CALCEOLARIA SOLANIIFOLIA Edwin, sp. nov.

Frutex, densetomentosus vel folia lanosa, calyx et corolla magna calycis lobi 11-14 mm. longi; corolla lutea, labium superum 4-6 mm. longum inferum ad 25 mm. longum; antherae magnae, loculi inaequans, septa et parietes incrassata, stylus 5.5-6.5 mm. longus; capsula quam calyx brevior; inflorescentia jugata in axilla foliorum supremorum ramorum disposita.

Erect, branched, densely tomentose shrub, up to about 2 m. tall. Wood, the oldest excepted, leaves, petioles flower-stalks and calyx bases densely beset with short, curled, white to brown, velvety, often matted hairs; leaves ovate, sometimes lanate, up to 8 cm. long and 5 cm. wide, rarely entire, mostly subentire to serrate-serrulate, apex acute, base obtuse, dark green above, light yellow-green beneath, veins very apparent to almost concolorous beneath; petioles 1.5-2.5 cm. long, thickened, very densely pubescent; inflorescences a pair of compound, cymose dichasia, in the axils of the uppermost leaves of the stem and branches; basal peduncles up to 8 cm. long, intermediate flower-stalks and pedicels abruptly decreasing in length, ultimately less than 1 cm. long; flowers large for the genus; calyx lobes ovate to elliptic, acute, 10-14 mm. long 3-7(-8) mm. wide at base, yellow or light green in life, glabrous to sparsely pubescent externally, the hairs on or near the margins; corolla yellow, frequently minutely papillose, upper lip 4-6 mm. long; lower up to 25 mm. long, frequently 20-22 mm., saccate about one-half its length, the sac ovoid-oblong, 12-14 mm. wide, inflated in life; anther cells a little unequal in length and very unequal in shape, walls and septa thickened, both cells at least 2 times longer than wide, each anther 7-8 mm. long, the smaller cell 3.0-3.5 mm. long; style 5.5-6.5 mm. long, apically curved, ovary ovoid, pubescent, a little shorter than the style; capsule pubescent, ovoid or elliptic-ovoid, shorter than the calyx, acute apically.

Amazonas: Prov. Chachapoyas: E. side of Cerro Calla-Calla on lower and middle slopes. Jalca interfingered with loma and montane forest, alt. ca. 2800-3200 m., Edwin 3628, (F); 3626; 3630; mountains E. of Balsas, alt. ca. 3200 m., Osgood & Anderson 76.

This taxon is distinct from all other Calceolarias in having the combination of unequal anther cells, large corolla, dense tomentose or lanate pubescence, large thickened leaf-blades on long petioles and paired inflorescences, arising from only the uppermost pair of leaf-axils of the stems and branches.

## CALCEOLARIA SONCHENSIS Pennell ex Edwin, sp. nov.

Herba pubescentia usque ad 5-6 cm. alta, caulibus squarrosis,

sulcatis-striatis. Laminae foliorum lateovatae vel triangulari-ovate petiolata suprema excepta ea sessiles untrinque pubescentiae 2.5-4.5 cm. longae, 1.5-2.3 cm. latae irregulariter duplodontatae; petioli alati connati prope caules latissime integri vel minuteserrati; inflorescentiae cymosodichasiae, sepala 10-12 mm. longa ovata acuta vel frequenter acuminata marginibus distanter vel dense serratis dentibus spinosis nigris; corollae luteae parvae labia subaequales 7-8 mm. longa et lata.

Pubescent herb up to 50-60 cm. tall, stems square, sulcate-striate. Leaves bizarre, blades broadly ovate or triangular-ovate, 2.5-4.5 cm. long and 1.5-2.3 cm. wide, irregularly doubly dentate, apex acute, base truncate or broadly obtuse, petiolate, the uppermost excepted, these sessile, pubescent on both sides; petioles broadly winged, connate, widest at or near the stem, entire or minutely serrate, usually a little shorter than the blades; inflorescences in axils of upper leaves, cymose-dichasia, the lax pedicels ca. 23-33 mm. long, on peduncles up to 15 cm. long, usually exceeding 10 cm.; sepals ovate, 10-12 mm. long, acute or frequently acuminate, margins distantly or less often closely serrate, the teeth black, spinose, calyx tube very short, ca. 1 mm., calyx externally pubescent; corolla wholly glabrous, small for the genus, upper and lower lips subequal, ca. 7-8 mm. long and wide, the hooded upper lip completely covering the brown, divaricate, oblate anthers whose filaments do not exceed 1 mm. long; style ca. 2.5-3.5 mm. long, exceeding the stamens, ovary pubescent with short, erect hairs, ovoid or hemispherical, shorter than the style; capsule 2-3 mm. long, sub-hemispherical or broadly ovoid, tapering to apex, densely pubescent, loosely invested by the sepals.

Amazonas: Mountain south of Tambo de Ventilla, thin loam over clay banks alt. 2700-2900 m., Pennell 15791, (PH, type; F; NY). The only collection known.

Close to Calceolaria connatifolia Pennel from which it differs in having mostly petiolate leaves, serrate sepals and glabrous corolla with subequal lip as well as in the general presence of pubescence and shape of the anthers.

#### CALCEOLARIA SUBSCAPOSA Edwin, sp. nov.

Herba annua erecta, caules glabri, usque ad 3-jugis laminarum et interdum paudiramosi. Flores plerumque 2, ad apicem, pedicellata rare in cymosis 3-floribus disposita; internodiâ longior quam lamina; lamina longipetiolata, ovata dentata usque ad 2-jugis lobarium; calyx et corolla glabra excepte labium inferum proxime glandulosa; loculi antherarum omnino fertili subapproximati, connectivum excedenti; capsula abrupte angustata ad apicem.

Erect, annual herb, up to 20 cm. tall, stem with up to 3 pairs of leaves and unbranched or occasionally once-branched, rarely twice-branched, apically usually bearing 2 flowers when unbranched, or each apex 2-flowered when branched, rarely with a 3-flowered cyme at the apex, stems glabrous, internodes several times longer than the small leaves. Leaves petiolate, blades ovate in outline, up to about 1.0 cm. long and 0.8 cm. wide, usually sparsely puberulent above, thinly pulverulent beneath, margins dentate to with 2 pair of dentate-denticulate lobes; petioles up to about half as long as the blade especially on the lowermost pair of leaves, decreasing in size to the apex of the stem, puberulent; pedicels mixed glandular and eglandular pubescent, mostly 3.5-5.5 cm. long; bracteoles occasionally developed near the base of the flower-stalk; sepals glabrous, broadly ovate, acute, 4.5-5.0 mm. long and 3.8-4.2 mm. wide, margins entire, a little thickened; corolla yellow, 9-11 mm. long; upper lip glabrous, ca. 4 mm. long, lower lip not twice as long as the upper, sparsely red-gland-dotted proximally on the upper part of the sac that is about three-fourth the length of the ca. 7 mm. long lip; both anther cells fertile, both larger than the very short, thin connective; style ca. 1.5 mm. long; capsule from as long as to more often longer than the calyx, ovoid, basally ca. 4.5 mm. wide, abruptly narrowing to a neck about one-third the length of capsule, sparsely gland-tipped-pubescent, glands soon fugitive.

Known only from the copious type specimen.

Lima: Along Rio Chillon, above Obrajillo, open rocky banks alt. 2800-3200 m. Pennell 14410 (PH).

No other taxon in this subgenus has the following combination of characters; subscapose stem, almost wholly pedicellate flowers, lower corolla lip less than twice as long as the upper and anther cells both fertile and separated by a very short connective.

*CALCEOLARIA TRILOBA* Edwin, sp. nov.

Frutex lignis juvenalis dense tomentosis; lamina subcoriacea, margines revoluta lateraliter biloba ad basim; flores solitariae vel in 3-flores dichasiam, exillariae vel terminaliae, calycis lobi intus pilosi vel glanduloso-puberulenti, glandulae nitidae rubrae, corolla extus glabra vel glandulosa, glandulae rubrae, vel papillosa, labium subtum saccatum plus quam medio.

Climbing or erect shrub, wood densely tomentose when young, vesture decreasing with age, densely foliaceous on distant or close branches. Leaves subcoriaceous, broadly ovate in outline, less than 1 cm. long and wide, pilose above, densely lanate

beneath, the vesture obscuring the tissue, margins little to very thickly revolute, with one pair of broad, basal, lateral lobes, these either divergent or somewhat antrorse, when divergent base of blade truncate, when antrorse base broadly ovate; costa and few secondary veins very deeply impressed above; flowers solitary or in 3-flowered dichasia, axillary in the upper parts of branches or terminal on the stem; flower stalks up to 2 cm. long, mostly shorter, less than 1 cm. long, densely tomentose; calyx externally pilose or puberulent, internally pilose or glandular-puberulent, glands shining red, elliptic to ovate, 4-5 mm. long and 2-4 mm. wide, acute; corolla yellow, often with 1 or 2 purple bands, externally glabrous or red-glandular and papillose, internally with a tuft of white hair at the base of the lower lip; upper lip minute; lower lip 14-18 mm. long, saccate more than half its length, sac abruptly flaring, flobose, upturned; anther cells divaricate, equal, each pair 2-3 mm. long, more or less than twice as long as wide, filaments shorter than the style; style thickened 2-3 mm. long, apically curved; capsule unknown.

Ancash: Polylepis thicket, alt. 3500-3700 m., mountain E. of Copa Grande, N. of Chancos, Pennell 15317 (PH, type; PH; US;). -- Libertad: open jalca above Motil, alt. 3200 m., Pennell & Ferreyra 14848.

Two varieties the typical and one other might well be established for this taxon based on corolla vesture, amount of recurving of leaf margins and calyx lobe shape. But in view of the scanty material the taxon is provisionally treated as composed of only one variety.

This taxon is close to C. inaudita Kranzl., which differs in having almost equal corolla lips, only barely lobed leaves reinform anther cells.

#### CALCEOLARIA VARIEFOLIA Edwin, sp. nov.

Frutex lignia adpressis puberulis; inflorescentiis 3-floribus dichasiis; calycis-lobis ovatis, obtusis, 4-5 mm. longis; corollis 16-18 mm. longis, labio supero 1-2 mm. longo, infero glabro, saccato minus quam medico; filamentis incrassatis aequaliter basim ad apicem, loculis antherarum aequalibus vel inaequalibus; stylis ca. 2 mm. longis; ovariis dense rubropunctis obtectis.

Divergently branching shrub, wood and flower stalks appressed-puberulent, branches opposite, distant, main stem aphyllous or almost so. Leaves ovate, sometimes very broadly ovate, 2.5-6.0 cm. long and 0.8-4.0 cm. wide, usually 4-5 cm. long, acute at apex, obtuse to almost acute at base, margin subentire to sub-distantly serrulate-serrate, puberulent above, red-punctate



beneath, punctations a little impressed or on the surface, very short petiolate to subsessile; petioles 0.3-2.0 mm. long, thickened; inflorescences 3-flowered dichasia in the axils of the upper pairs of leaves; flower stalks up to 1.5 cm. long, usually a little shorter; calyx lobes pubescent on both surfaces, especially on and near the margins, ovate, 4-5 mm. long and ca. 3.0-3.5 mm. wide, obtuse; corolla yellow, glabrous, ca. 16-18 mm. long, upper lip reduced to a ring, ca. 1.0-1.5 mm. long, lower lip saccate less than half its length; filaments short, equally thickened base to apex, anther cells less than twice as long as wide, equal or a little unequal; style ca. 2 mm. long; ovary densely red-glandular; capsule unknown. Only the type collection thus far seen.

Piura: Rocky bank above Canchaqui, alt. 1700-1900 m.,  
Pennell & Ferreyra 14916, (US, type; PG).

Differs from Calceolaria boliviana (Britton ex. Rusby) Pennell in having much smaller flowers with ovate calyx lobes as opposed to lanceolate lobes and short style, ca. 2 mm. long as opposed to 6-8 mm. and finally the vesture and branching habit differ.

CALCEOLARIA VELUTINOIDES Edwin, sp. nov.

Vena foliorum densissime infra lanosotomentosa, folia usque ad 2 cm. longa et 1.0-1.2 cm. lata, plerumque parviora; calycis lobi extus pilosi et rubropunctati, intus pubescenti in marginibus; corolla glabra, 8-12 mm. longa, labium inferium fere latum quam longum; loculi antherarum plerumque duplo vel triplo longior quam latior.

Erect, branched shrub, wood, except the main stem and flower stalks, densely lanose-tomentose, main stem glabrate, wood usually drying light brown. Leaves short-petiolate, densely matted-pilose-tomentose above and on the veins beneath, orange-red punctulate beneath and sometimes sparsely so above, ovate, usually not exceeding 2.0 cm. long and most often 1.0-1.2 cm. wide, a few longer and occasionally narrower, margins a little thickened, crenulate to entire, apex acute, base sub-obtuse; flower stalks mostly not exceeding 1.3 mm. long; inflorescences corymbose-dichasia, usually once branched, few-flowered, terminal or axillary in upper leaves; calyx lobes externally pilose and red-punctulate, internally with a row of white hairs along the margins and at the acute to short-acuminate apex, ovate, ca. 6 mm. long and 4 mm. wide; corolla yellow, glabrous, 8-12 mm. long, upper lip reduced to a narrow ring, lower saccate less than half its length, almost as wide as long; filaments less than 2 mm. long, anther cells equal, divergent, usually 2-3 or more times longer than wide, occasionally only ca. 1.8 times; style ca. 2 mm. long, little if at all thickened; ovary glabrous to glandular-pustulate; capsule not seen.

Amazonas: Cerro Puma-urcu, SE of Chachapoyas, shrub on and near rocks, alt. 3100-3200 m., Pennell 15555, (US, type; PG); Cerro Puma-urcu, SE of Chachapoyas, rocks near base of cliff, alt. 3300-3400 m., Pennell 15695.

Close to C. croceopunctata and C. rugulosa Edwin, differing from the former in inflorescence structure, style length and in lacking an acumin at the apex of the septum separating the anther locules and from the latter in having much smaller leaves and shorter petioles, simpler inflorescences, and also glabrous corolla with longer sac.

CASTILLEJA BRACTEATA Edwin, sp. nov.

Herba perennis caespitosa, bracteis divisis ex medio in 3 segmentis lanceolatis eis divisis in lobis binatis; calyce inaequaliter fisso antico quam postico profundiore, genitalia inclusa in galeam, stigmatibus lobi connatis, capsula ovoidea vel oblonga ad apicem obliqua acuminata.

Densely matted, dwarf, perennial herb, up to 5 cm. tall, from a knob-like rootstock. Stems obscured by the leaves that are longer than the inter-nodes, puberulent and angled; leaves narrowly lance-ovate or -oblong, minute to about 1.5 cm. long, usually with 1 or a pair or 2-pair of short, linear or narrowly lanceolate lobes mostly from the upper part of the blade, occasionally entire, viscid, puberulent-ciliate on the margins, sessile, acute, little or sometimes not at all narrowed to base; inflorescences short, dense spikes; bracts 11-14 mm. long, margins ciliate, broadly ovate in outline, divided from about the middle into 3 divisions, the lateral divisions usually dividing once again, the median once or twice, lobes lanceolate, acute, decreasing in length from primary to secondary and tertiary, drying green (red-tipped?); flowers (and fruits) sessile; calyx red-tipped or green, broadest at the apex, regularly, slightly tapering to the base, subcylindric or subsalverform, 13-18 mm. long, puberulent on the main veins and tissue above on both surfaces, ciliate-puberulent on the margins, lobes obtuse, median cleavages very unequal, about one-fourth the length of the calyx (above) posteriorly and one-half way (below) anteriorly, lateral cleavages lacking or the lobes merely reflexed or emarginate; corolla 15-24 (-26) mm. long, exceeding the calyx, at least part of the galea exerted, usually up to one-half its length, galea densely puberulent externally, often red-reen; 6-10 mm. long, margin thickened, inrolled, lip very short, included in the calyx, the 3 lobes lanceolate, hardened, in-folded, sac moderately developed; stamens didynamous, pairs almost equal in length, the longer pair 1-2 mm. shorter than the galea, included; style and stigma about reaching the longer stamens, stigma lobes capitate-punctiform, wholly united;

capsule narrowly ovoid or oblong, 12-14 mm. long, oblique near the acuminate apex; seeds numerous. loosely enveloped by the reticulate testa, reticulations dark.

Cuzco: Prov. Calca, Pisac, prados humedos, alt. 3400 m., April 1943, Marin 252 (F).

This well marked species, especially as to habit of plant and the lobing of the bracts is also technically unique not fitting into any section of the genus thus far described.

CASTILLEJA CERROANA Edwin, sp. nov.

Calycis lobi lateralis fissi 1.5-2.5 mm., lobulis subaequaliter deltoideis vel ovatis acutis; calycis tubus fissus aequaliter vel subaequaliter medianus et tubus et lobi dense pubescenti, pubis laxis; corollae labia exserta, labium anteriorum plus quam galeam one-half longam, saccata non indurate; stylus et stamina vreviores quam galeam, stylus longior ad brevior quam stamina, stigmati lobi indivisi, capitata-punctiformi.

Erect, pubescent, little branching, perennial herb, 40 cm. tall. Stem densely pubescent, hair soft and a little curly, neither twisted nor matted; leaves pubescent on both surfaces, lanceolate, narrowly oblong or linear, up to 3 or 4 cm. long, usually with a pair of short, linear lobes from above the middle, entire, acute, narrowed to the base, sessile; inflorescences spikes up to almost one-half the length of the stem, terminal on the main stem and appressed branchlets; flowers dense when young, less so at maturity; bracts densely pubescent on both surfaces, linear- or narrowly oblanceolate in outline, sessile, with usually 2-pair of linear, acute lobes, the longer pair, from below the middle always developed the shorter subapical pair sometimes wanting; flowers on very short, ca. 0.5-1.0 mm. pedicels; calyx 17-19 mm. long, densely long-lax pubescent without, shorter pubescent within, tube cleft equally, or subequally medianly to below the middle, lateral cleavages 1.5-2.5 mm. long, the lobes subequal in size and shape, deltoid or ovate, acute; corolla 20-22 mm. long, lips exserted, lower lip ca. 6 mm. long, saccate, not indurate, pale yellow, lobes linear, acute, erect, galea 9-10 mm. long, carmine-red, densely stiff, golden, pubescent externally, margins inrolled, thickened; stamen pairs very unequal in length, the upper a little shorter than and included in the galea; -tyle longer or shorter than the stamens, included, stigma lobes united, punctiform; capsule narrowly ovoid, 14-16 mm. long, suboblique near the short-acuminate apex; seeds numerous, narrowly ovoid, the loose testa dark-reticulate.

Ancash: Cordilera Blanca, alt. 4400 m., Rauh-Hirsch P2096 (F).

This taxon is close to Castilleja pseudopalescens Edwin, differing in the lateral cleavage of the calyx, the calyx lobe size and shape, general pubescence and in the lobing of the bracts.

The collection is from the highest altitude so far recorded for the genus.

CASTILLEJA PSEUDOPALLESCENS Edwin, sp. nov.

Calycis lobi lateraliter fissi 3-5 mm. lobulis lanceo-attenuatis tubus subaequaliter medianus; corollae labia exserta labium anteriorum plus quam one-half galeam longam, saccata non indurata; stylus et stamina 2-3 mm. breviores quam galeam stigmati lobi connati capitata-punctiformi.

Erect herb up to 22 cm. tall, stem puberulent-pubescent, foliage puberulent-ciliate, stem alternate branching from near the base, drying yellow-to-purple-brown, subshining, internodes 2-3 cm. long, at least on lower half of the stem; leaves lanceolate, narrowly oblong or linear, usually with 1-pair or 2-pairs of long or short, linear lobes, from minute to about 3 cm. long, most often 1.0-2.5 cm. long, lobes and blades acute, blades sessile, sometimes clasping; inflorescences lax or dense spikes; bracts a little wider than the leaves, with 2 or more often 3 pairs of linear lobes, the pair nearest the base longest, the pair at the apex shortest; flowers sessile, red-tinged; calyx 18-21 mm. long, cleft subequally medianly, tube puberulent or subglabrous, veins and lobe margins ciliate-ciliolate, lobes lanceolate, attenuate, laterally cleft 3-5 mm.; corolla well exserted, 25-28 mm. long, lip ca. 6 mm. long, little more than half as long as the galea, a little saccate, the 3 lobes linear or narrowly lanceolate, obtuse, galea dorsally pubescent, red or purple, 10-11 mm. long; stamen pairs only little unequal in length, the longer 2-3 mm. shorter than the galea; stigma lobes wholly united, capitata-punctiform, reaching the longer pair of stamens; young capsules narrowly ovoid, ca. 15 mm. long and 6-7 mm. wide, oblique near the acuminate apex; seeds linear to narrowly ovoid, the loose testa darkly reticulate.

Apurimas: Prov. Grau, cuestra Quellipata, stony slopes at alt. 2700 m., March 9, 1946 Vargas 5800 (F).

This taxon is related to the species of the section Pallescentes of Western North America and may be placed therein.

## CALCEOLARIA VIRGATA f. LLAMAENSIS Edwin, f. nov.

Herba vel frutex, differt a typica laminis pubescentiis infra solis in venis; calycem lobis 7-10 mm. longis; stylis 3-4 mm. longis; petiolis brevissimis, vix 1 mm. longis.

Herb or shrub differing from the typical form in the following ways: leaf blades pubescent beneath on the veins only; calyx lobes 7-10 mm. long; style 3-4 mm. long; petioles very short, hardly 1 mm. long.

Cajamarca: Herb, open bank, below Llama, alt. 1850 m., Pennell 15914 (PH, type; US); Shrub, banks and rocks, Llama, alt. 1900-2400 m., Pennell 15919.

## CASTILLEJA VIRGAYOIDES Edwin, n. sp.

Calycis lobi lateraliter integri tubus fissus inaequaliter medianus; corollae labia exserta, labium anteriorum brevissimum non saccatus, galea quam labium ca. 5x longior; stylus et stamina galeam equitans, stigmatus lobi indivisi clavati; capsula obliqua ca. 14-15 mm. longa.

Erect, clumping, perennial herb up to 25 cm. tall. Stems pubescent in the inflorescence and either puberulent below or becoming glabrate near the base or entirely glabrous and shining brown; leaves linear or lanceolate, pubescent or puberulent on one or both sides, up to 3 cm. long, usually with 2 or 3 leaflets in the axil, entire, usually with a pair of short, linear lobes, narrowed to an acute apex, sessile; inflorescence a spike or spicate in flower, racemose in fruit, often interrupted below; bracts with 1- or 2-pairs of lobes, little wider than the leaves, distally red (in vivo); flowers on short, ca. 1-2 mm. long, pubescent pedicels; calyx tubular, 15-17 mm. long, pubescent on both surfaces, obtusely rounded apically, medianly cleft very unequally, posteriorly only 2-3 mm., anteriorly beyond the middle, ca. 10-12 mm., lateral cleavages lacking; corolla about 20-24 mm. long, galea yellow-green (in vivo), about 10-11 mm. long, exserted, pubescent externally; lip rudimentary, ca. 1.5-2.5 mm. long, little if at all inflated, the lobes linear, the median shorter than the lateral; stamens included, pairs only a little unequal in length, anthers linear; stigma and style reaching to about the longer stamens, stigma lobes united, clavate; capsule drying black, glabrous, oblique near the short-apiculate apex, borne on pedicels up to 8 mm. long, placenta medianly thickened, septum early deciduous; seeds numerous, ovoid, the reticulate testa loose.

Cuzco: Prov. Cuzco, open rocky hill on trail to Pisac at alt. 3500-3600 m., April 28-30, 1925, Pennell 13699 (F, type: GH; NY:

PH). Apimac: Salcantay, 4300 m. alt., Rauh-Hirsch P. 1398. -- Ayacucho: La Quinau, grassy banks, alt. ca. 12,000 ft., Macbride & Featherstone 2002. -- Cuzco: Cordillera Veronica, alt. 3300-3500 m., Rauh-Hirsch P964. -- Huancayo: Huayta-pallana, alt. 4600 m., Rauh-Hirsch P1718. -- Junin: Mount La Juntay, near Huancayo, about alt. 4700 m., Killip & Smith 22085. -- Lima: Canta, mountains above Canta, Pennell 14429; East of Canta, alt. 4000-4200 m., Pennell 14686. -- Sin. Depto.: Viso, shrubby slope, alt. ca. 9000 ft., Macbride & Featherstone 581; Sin. Loc.: Diehl 2563.

This species is closely related to C. Virgata Dombey ex Wedd. from which it differs in having smaller flowers and fruits, shorter stigma and style in relation to the stamens and galea and in the shorter calyx in relation to the corolla. Further the calyx lobes of C. virgata are laterally secondarily retuse and the (lower) lip of the corolla is clearly saccate. Both C. virgata and virgatoides are closely allied to species of the western United States that are now placed in the section Linariaefoliae. However, the Peruvian taxa differ sufficiently to warrant separate sectional status.

## REFERENCES

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